Products finishing

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PRODUCTS finishing

WITH many plants operating "around the clock," we find an increased demand on the stamina and patience of individual workmen. Such a demand sometimes has the detrimental effect of wearing down the keen edge of alertness which otherwise would be present. At such times, he is more susceptible to accident and injury than he would be otherwise and every precautionary measure should be taken to ensure against physical fatigue. But even considering that the most conscientious program of accident prevention is in effect, there are times when even these programs fall short of fulfillment.

Safety articles are usually devoted to discussions to accident prevention measures, but accidents will happen—in fact, under the heavy pressure now being put on industry, they are increasing rapidly—and it is important to know what to do when the critical moment arrives. This month PRODUCTS FINISHING presents one of the first articles ever published in an industrial magazine which makes an attempt to explain the elements of first aid and tell what should be done in any one of a number of different types of accidents.

The finishing department is one of the most important links in the chain of metal-manufacturing operations and delays due to accidents in this department usually mean the loss of time which cannot be regained. So, be on the alert to remove all possible hazards; but if an accident does occur, be sure that you have sufficient information to cope with the situation. Read "What Every Shop Executive Should Know About First Aid."

SEPTEMBER, 1941 **Vol. 5, No. 12**

High temperature, moisture, and fumes will not discolor these white plastic-coated instrument dials.

White Dials for Westinghouse Instruments

By BARTLETT WEST

IN ADDITION to the requirement of accuracy, the most desirable feature of electrical indicating instruments is easy readability. For a long time where such instruments were placed in service under conditions of high temperatures, light, chemical fumes, moisture, or dust, the dials soon become faded, discolored, or even corroded. Many types of finishing materials were tried, but each met with little success.

Since from the standpoint of easy readability the most desirable color combination is black and white, the dial of the instrument was finished in white and the numerals were finished in black. Obviously, the black numerals against the white background provides maximum readability and a finish-material which will maintain

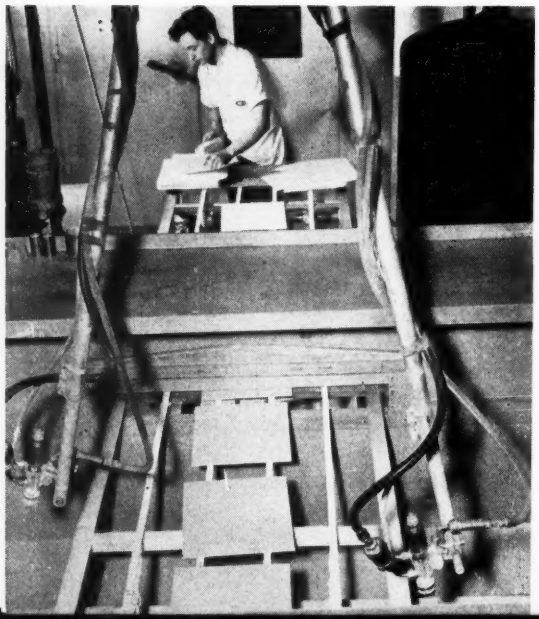


Fig. 1—The plastic coating is sprayed on metal sheets by these two oscillating spray guns.

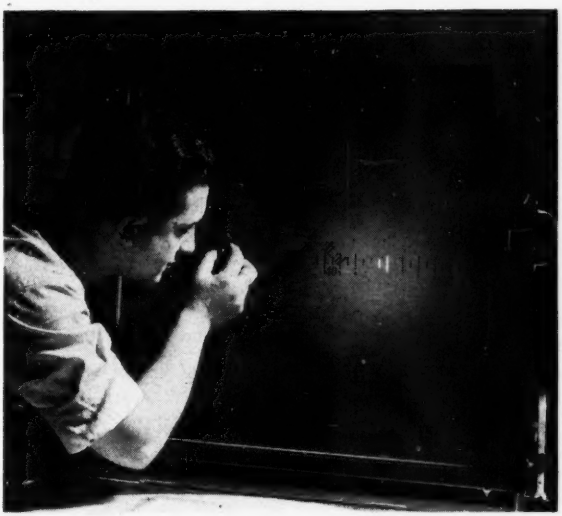


Fig. 2—The dials are laid out accurately on a large scale by hand and then reduced to size by photographing them in this camera.

those particular qualities of blackness and whiteness over the longest period of time would be the most desirable.

Several weeks ago, the Westinghouse Meter Division, Westinghouse Electric and Manufacturing Company, Newark, N. J., made the announcement that it had developed a liquid plastic material which resisted the deteriorating effects of heat, fumes, moisture and which could be sprayed on metal in the same manner as lacquer or paint. In comparative tests previously white finished dials changed to a light coffe brown after 10 hours of exposure to dry air at a temperature of 317 degrees Fahrenheit. Fumes from heated raw phenolic plastics changed white to straw color after 120 hours, and a saturated sulphur dioxide atmosphere mottled dials with yellow splotches after 100 hours. Under identical test conditions, the new plastic-coated dials were practically unchanged. A clearer picture of the dials is obtained from a short review of the steps involved in the finishing operation. The following account together with the accompanying illustrations should serve that very purpose.

Foundation of the dial is a metal sheet that is given a spray of the new liquid plastic material, which is hardened on the surface by means of

Fig. 3—Printing on the plastic finish requires carefully controlled atmosphere, special ink, and a special press as shown here to obtain uniform results.

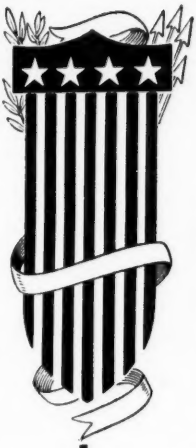
Fig. 4—Periodic tests for stability make sure that the plastic coating will not discolor under adverse conditions in service.

quick heating and then force drying completely by means of controlled baking in an electric oven. One of the features of the finishing setup is air conditioning for close process control. In the spraying department shown in Fig. 1, dust and other airborne particles are removed and controlled in an interesting manner. The spray finishing room itself is sealed tightly and is kept under filtered air pressure during the spraying operation, so that no outside air is admitted.

The sheets to be coated are placed on the moving conveyor by the operator shown in Fig. 1. As the sheets come within the range of the spray nozzles, the shafts to which they are attached move back and forth across the path of the sheets, thus coating them thoroughly and evenly. The coated sheets pass directly to a heating tunnel where the surface is hardened quickly so that dust will not adhere to it. The heating tunnel through which the coated sheets pass was specially constructed in order to prevent outside dust particles from coming in contact with the freshly applied finishing plastic material.

After being coated with the liquid plastic finishing material, dial faces are lithographed on the metal sheet. Numerals for the dials are laid out accurately on a large scale by hand,

Fig. 5—The dial is assembled on an instrument chassis and is then ready for calibration.



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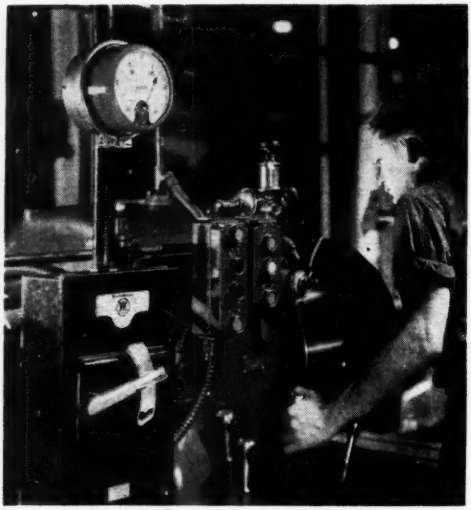

Fig. 6—Illustration showing a typical instrument installation. Resistance to aging influences will keep the newly finished dial permanently white.

then reduced to size by photographing them in the camera shown in Fig. 2. The dimensions are held within 0.005 in. The next step in the finishing of the dial is carried out in a printing department.

Since the plastic surface is hard and almost completely impervious to ink, the printing operation is an extremely delicate process. The press, a special type of machine as shown in Fig. 3, is used in a carefully air conditioned room, all incoming air being cleaned by passage through a bank of electrostatic precipitators. Without this closely controlled atmosphere, the printing operation would be impossible on particularly humid days.

Periodic tests and observation for stability are made to determine the color fastness of the plastic coating, thus making certain that the finish will not discolor under adverse service conditions. In one particular test for resistance to moisture, the dials are placed in a tightly sealed cabinet, as shown in Fig. 4. The dials remain in this cabinet which is maintained at 100 per cent relative humidity and elevated temperature for several weeks, as part of the testing proceedure.

As the dials are lithographed, register markings are imprinted on them so that they can be blanked in the right positions with respect to the markings. The register holes are then punched out and the sheets are transferred to a blanking press. The position of the dial face is determined by alignment of pins in the blanking die with the register holes.

When all the blanking and forming operations have been completed, the completely finished dial is transferred to the assembly department. In this department, an operator as shown in Fig. 5 places the dial on an instrument chassis and prepares it for calibration and final testing. According to results obtained thus far, the remarkable resistance offered by this plastic finish to aging influences of all kinds indicate that the dials will remain permanently white.

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PRESIDENT

What the Shop Executive Should Know About First Aid

By DON NIMMO

Director, First Aid, Life Saving & Accident Prevention
American Red Cross, Cincinnati, Ohio

PROBABLY one of the most certain results of the current step-up in production in the metal-manufacturing industries will be an increase in the frequency and severity of accidents. New machinery, new processes, and new operators comprise a combination which cannot be depended upon to run smoothly and safely. This fact is particularly true in view of the increasing tension of production demands.

What would you, as department head, do if one of your workmen

—fell from a ladder or scaffold?

—had an artery severed?

—was knocked out by electric shock?

—was seriously burned by flame, chemicals, metals, or liquids?

—had a hand or limb accidentally amputated?

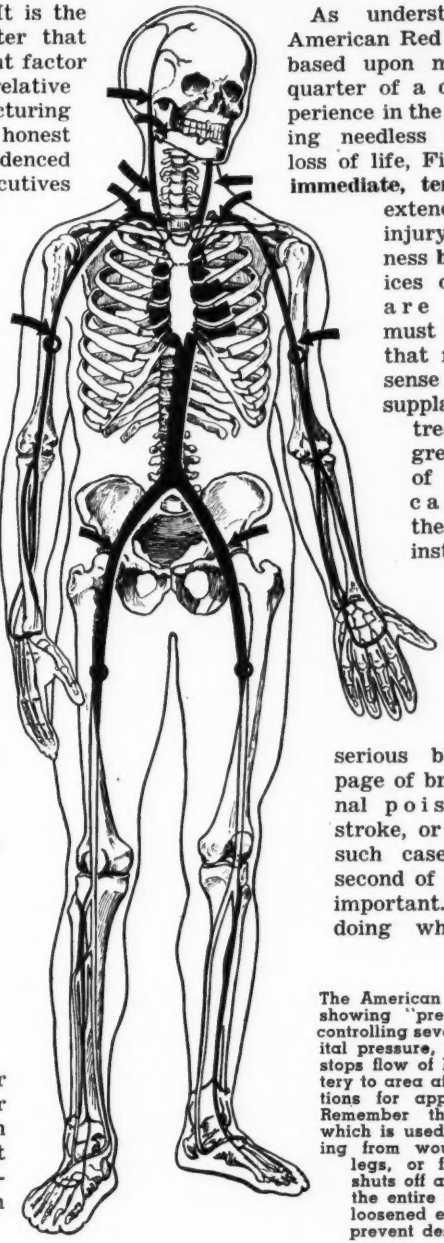
—fainted from excessive heat? A study of the few First Aid Pointers in this article may help you to save a life.

American industry has, during the past two decades, made encouraging progress in the field of safety. The continuous campaign waged by employers against industrial hazards has paid untold dividends in reduced insurance rates, in lowered production costs, and increased efficiency and employee morale. And no plant executive should raise an eyebrow concerning this statement regarding employee morale. The experience generally has been one of difficulty in "selling" safety to the plant personnel; yet in practically every instance of intelligent handling of this problem, one of the results has been an improved attitude on the part of the employees as a whole. However, in spite of all that may be done to avoid accidents, it is almost inevitable that the increased tempo of production will result in an increase in the frequency of accidents to workers.

Now, it is all very well to sit back and smugly contemplate the statistics on accidents and injuries in the industry as a whole, or in the other fellows' plants, but reality literally smacks us in the face when it is in **our** plant, and to **our** employee, that

the tragedy occurs. It is the judgment of the writer that the one most important factor in determining the relative safety of a manufacturing plant is the degree of honest interest personally evidenced by the supervising executives in that plant. As the officer in charge, the responsibility of the department head is multiplied in an emergency; the employees under his charge expect him to be as capable in such a moment as he is in the ordinary routine of operations, and accordingly depend on him for intelligent direction.

To get down to cases, and to come specifically to the point of this discussion, let the reader ask himself if he is satisfied with the existing facilities for first aid in his plant or department. Does each of us realize just what is meant by this frequently - abused term "first aid?"



→ Pressure Points for the Control of Bleeding

○ Points for Applying Tourniquet

The American Red Cross Chart showing "pressure points" for controlling severe bleeding. Digital pressure, correctly applied, stops flow of blood through artery to area affected. Note locations for applying tourniquet. Remember that a tourniquet which is used to control bleeding from wounds in arms or legs, or from amputations, shuts off all blood supply to the entire limb and must be loosened every 15 minutes to prevent destruction of tissue.

As understood by the American Red Cross, and as based upon more than a quarter of a century of experience in the field of reducing needless suffering and loss of life, First Aid is the **immediate, temporary** relief extended in case of injury or sudden illness **before** the services of a physician are available. It must be understood that first aid in no sense of the word supplants medical treatment. In a great proportion of serious injury cases, however, there is need for instant attention. This is particularly true when an emergency situation is involved—serious bleeding, stoppage of breathing, internal poisoning, heat stroke, or bad burns. In such cases every split second of time is vitally important. First Aid—doing what you can,

First Aid in serious bleeding cases must be given AT ONCE—right at the scene of the accident. No special equipment is needed to stop bleeding. The same hands which operate a spray gun, cleaning equipment or plating tanks can be used to save life by preventing serious hemorrhage. In this case the blood flow is being stopped by applying pressure at a "pressure point" inside the upper arm until a tourniquet can be applied.

•

with what you have, where you are—when injury happens is the factor capable of operating to tip the balance in favor of life in a life-and-death situation.

Some time ago a factory worker had his arm accidently amputated. His foreman witnessed the injury and did the best thing he knew to help his workman. Did he give first aid? No; he ran the equivalent of two city blocks through the plant to get a tourniquet from the nearest first aid station and to telephone a hasty message to the main office. During all this time the unfortunate victim lay on a cold concrete floor, his life blood spurting from his body through the severed artery in the remaining stump of his arm. The man did not live. First Aid—immediate, temporary care—would likely have saved his life.

In this instance, correct first aid would have involved immediate control of the hemorrhage—shutting off the blood flow—by pressure with the

•

With a tourniquet quickly improvised and applied, the victim is placed in the correct "shock" position and kept warm. Smelling salts, aromatic spirits of ammonia, or other stimulants are used AFTER the bleeding is controlled.

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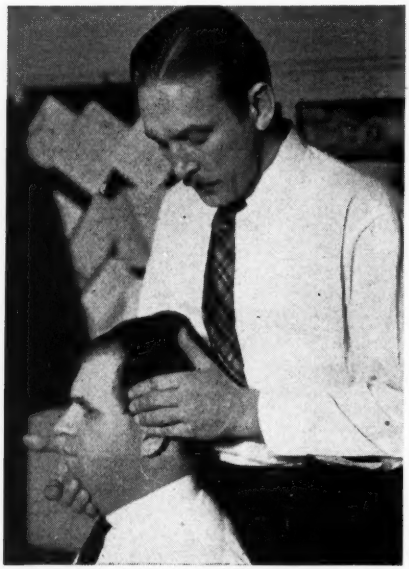
fingers on the large artery at the inner side of the upper arm, close to the arm pit, collapsing the artery against the single bone which extends from the shoulder to the elbow. This act would have stopped the bleeding in less time than it has required to read the preceding sen-



Bleeding from the forehead or scalp can be controlled by applying pressure to a "pressure point" in front of the top of the ear. Here, as in all "pressure points," the artery supplying a definite area is collapsed against underlying bone.

tence, after which prompt attention should have been given to the shock condition which is generally present in cases of serious injury.

While continuing to control the bleeding the foreman should have taken steps to preserve the body heat of the victim by covering him with coats, burlap bags, canvas, or any other available insulating materials. Then would have been the time to send for a tourniquet, also for woolen blankets, chemical hot - pads, stretcher, and to summon a physician. First aid thus given might have saved the life of this worker. Knowledge and skill and a simple understanding of what to do and what not to do—these are the important things.

There are several different kinds of accidents which can result in stoppage of breathing. The human machine can exist for many days without food, for several days without liquids, but only for a brief space without oxygen. In the finishing department the chief sources of this danger are liable to be in the electrocution, drowning, asphyxia from gases or fumes, suffocation, and shock resulting from injury. When, as a result of accident, breathing has ceased, nothing is so important to the victim as to have his breathing effected artificially until such time as he is able to resume respiration naturally, or until he may be found to be lifeless.

This "artificial respiration" must be started just as soon as possible following the discovery that breathing has stopped. The first item of consequence is, of course, the necessity of a safe rescue. It is obvious that efforts to revive a drowning person cannot be started until his body has been brought from the medium in which he has drowned. So it is in the case of gas poisoning—neither the victim nor the rescuer may safely remain in an atmosphere which already has prostrated the former. So, too, in cases of electric shock. Until contact between the victim's body and the damaging current has been removed, there is always danger of the would-be rescuer receiving the same overpowering jolt.

Again let us get down to cases. Your workman has just been rescued from a tank, from a gas-filled boiler,

from contact with electricity, or from a hopper cave-in. Consideration of injuries other than the stoppage of breathing may be deferred since they are likely to be of infinitely less consequence than the one single fact that your man is not getting oxygen.

Just a further word about artificial respiration. There is nothing magical or necromantic about reviving a person whose breathing has stopped accidentally. Thousands of persons are alive today who owe their lives to the interest and skill of Good Samaritans who in a critical moment breathed for them, keeping their bodies alive until the sensitive nervous tissues were able to resume the act of respiration naturally. And, by the same token, literally thousands of persons, men and women, young and old, know the joy which comes as a result of such service to a fellow human being in distress.

Properly accomplished, artificial respiration moves the air in and out of the lungs slowly and rhythmically, at a rate of 12 to 15 times per minute for adults. Preservation of body heat is of prime importance throughout. And proper care following restoration of breathing and of consciousness involves absolute rest, continued warmth and stimulation, and every possible encouragement. One must not be too quick to acknowledge defeat, for restoration of breathing has been established in numerous instances after several hours of artificial respiration.

Artificial Respiration

If, upon examining the accident victim it is found that breathing has stopped, do not stop to loosen the patient's clothing but immediately begin actual resuscitation. Every moment of delay is serious. If the mouth is tight shut, pay no attention to it until later. Proceed as follows:

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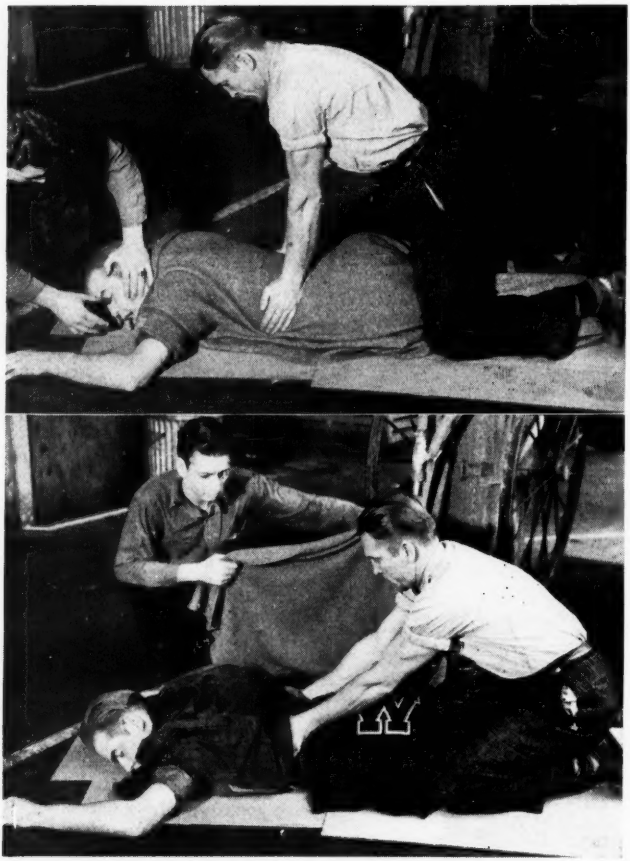

Applying artificial respiration. (Above) — Straddling the accident victim, the operator swings slowly forward with his arms held straight. (Below) — Swinging backward to remove the pressure. This action is repeated every four to five seconds.

1. Lay the patient on his belly, one arm extended directly overhead the other arm bent at elbow and with the face turned outward and resting on hand or forearm so that the nose and mouth are free for breathing.

2. Kneel straddling the patient's thighs with your knees placed at such a distance from the hip bones as will allow you to assume the proper position. Place the palms of your hands on the small of the patient's back with fingers resting on the ribs, the little finger just touching the lowest rib, with the thumb and fingers in a natural position and the tips of the fingers just out of sight.

3. With your arms held straight, swing forward slowly so that the weight of your body is gradually brought to bear upon the patient. Your shoulder should be directly over the heel of the hand at the end of the forward swing. Do not bend your elbows. This operation should take about two seconds.

4. Now immediately swing backward so as to completely remove the pressure.

5. After two seconds swing forward again. In this manner repeat, unhurriedly, 12 to 15 times a minute, the double movement of compression and release, or a complete respiration every four or five seconds.

6. Continue artifiicial respiration without interruption until natural breathing is restored — if necessary, four hours longer, or until a physician declares the patient dead.

7. As soon as artificial respiration has been started an assistant should loosen any tight clothing about the patient's neck, chest or waist. **Keep the patient warm.** Do not give any liquids whatever by mouth until the patient is fully conscious.

8. To avoid strain on the patient's heart after he has revived, he should be kept lying down and not allowed to stand or sit up. If the doctor has not arrived by the time the patient has revived, the patient should be given some stimulant such as one teaspoonful of aromatic spirits of ammonia in a small glass of water, or a hot drink of coffee or tea. Again, the patient should be kept warm.

9. Resuscitation should be carried on at the nearest point to where the patient received his injuries. He should not be moved from this point until he is breathing normally and of his own volition, and then moved only in a lying position. Should it be necessary, due to extreme weather conditions or similar causes, to move the patient before he is breathing normally, resuscitation should be carried on during the time he is being moved.

10. Do not stop resuscitation immediately upon return of natural respiration. Not infrequently the patient, after a temporary recovery, stops breathing again. The patient must be watched and if natural breathing stops, artificial respiration should be resumed at once.

11. In carrying out resuscitation it may become necessary to change the operator, in which case the change must be made without losing the rhythm of respiration.

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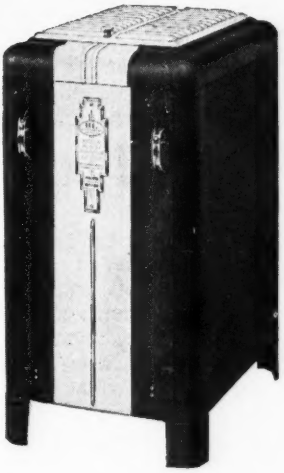

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ever, that while the inhalator is a valuable aid to resuscitation, it **does not** take the place of **artificial respiration.**

Serious burns may be sustained in the modern finishing department from contact with electricity, flame, chemicals, hot substances, metals, or liquids. Because of the excruciating pain attendant in burn cases, the shock condition of the victim is usually severe, consequently immediate steps must be taken to preserve life by combatting the lowered vitality and depressed bodily activities which are found in cases of severe shock. It may sound paradoxical, but shock, even when caused by the pain and destruction of burning or scalding, requires plenty of warmth, stimulation, preservation of bodily temperature, in addition to which the patient should be placed in the characteristic position with his head low and legs raised.

"Fireman's Carry" may be used to remove asphyxia victim to nearest safe spot to begin artificial respiration.

Burns are ordinarily classified as first degree (skin reddened), second degree (blisters), and third degree (destruction of tissue under skin). A first degree burn of a large area of the body surface is liable to be more dangerous than a third degree burn of a relatively small spot. Partial relief from pain is somewhat achieved by excluding air from the damaged surfaces. In cases of first degree burns, where the skin is unbroken, the air may be excluded by the use of a number of ointments especially prepared for the purpose. However, when the skin is broken the danger of infection must be recognized and the use of jellies, oils, ointments or greases may result in the necessity of their (painful) removal by the physician, who will likely insist that no risk of infection be permitted.

So it has been found infinitely preferable in applying first aid to second or third degree burns (in each of which the risk of infection is great) to use warm solutions of baking soda or Epsom salts applied with clean compresses or towels, or to use picric acid gauze (which requires only moistening with clean, preferably warm water), or to use a five per cent solution of tannic acid, which may be sprayed on with excellent results in first degree burns or applied as a wet dressing in cases of second or third degree burns.

Iodine must never be applied to a burn, nor may cotton be used directly on a burn, as it will stick and cause further damage when removed. Burned digits should be separated

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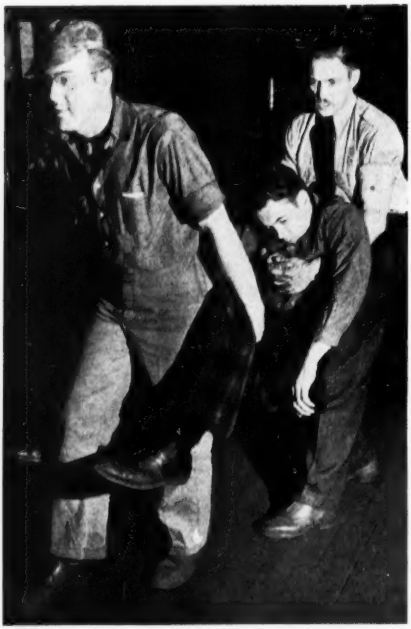
from each other by moist dressings before the hand or foot is bandaged. If the burn has been caused by wax, molten metal, or tar, removal of this substance, when it sticks, must await the doctor's attention. So also must the opening and drainage of large blisters.

Chemical burns require prompt and thorough flushing with water, preferably not too cold, and quick removal of clothing, boots, and whatever else might contain the damaging substances. Phenol (carbolic acid) burns should first be washed with rubbing or grain alcohol, if readily available. Chemically-burned eye tissues are best cared for by prompt flushing with clean water, followed by application of a sterile oil, with sterile compresses and prompt medical treatment, but the most important is immediate flushing with water.



DO NOT pick up and carry an accident victim in this manner. If a broken back, neck, hip, or skull is involved, untold aggravation of the injury will probably result.

Prompt and proper attention should be given to **all** wounds, however trivial in appearance. In such an industry as the metal finishing, which is so replete with hazards to fingers and feet, eyes and elbows, and skins and shins in general, modern practice demands that each and every worker who suffers **any** wound be given prompt attention.

It must be remembered that any break in the skin or mucous membrane may facilitate entrance of untold numbers of germs into the body tissues—the favorite spawning ground of our microscopic enemies — and that therefore such skin breaks must be properly treated. Probably no other single item in the whole of plant first aid endeavors is capable of paying higher dividends.

It is probable that there are few machine shops in the United States that are entirely without an excessive heat hazard somewhere in the plant. And since experience has demonstrated frequently fatal lack of understanding of proper procedure in such cases, a few words concer ng them may be helpful.

Last summer, to the personal knowledge of the writer, a boiler scaler was killed probably by a fellow workman who, in his desire to be of help, threw several buckets of cold water on the prostrated form of the heat victim. This was absolutely the wrong thing to do.

Working in an excessively hot atmosphere is liable to result in one of three conditions; heatstroke (sunstroke), heat exhaustion, or heat cramps. Your less hardy employees—those suffering from any general disease, the very old, the very young, the very fat, or the alcohol addicts—

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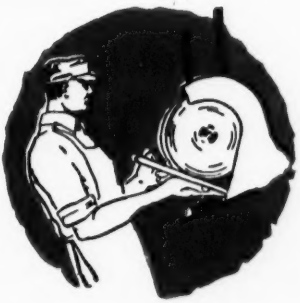

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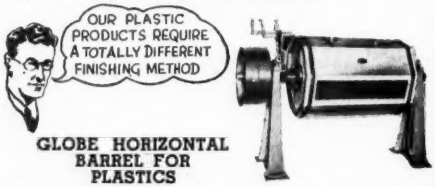

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these are particularly liable to be affected by too much heat.

The value of preventive measures has been recognized by a gratifying proportion of plant executives. Included are the ready availability of drinking water (not too cold), salt tablets, rest periods, short shifts, and proper clothing for all who must work under such conditions. Possibly the most important fact to be remembered in connection with instances of collapse resulting from excessive heat is this: exposure to the temperature and humidity of the same hot boiler room, the same August loading dock, or the same stuffy processing quarters can cause two nearly opposite types of ailments—"heat exhaustion," and "heat stroke." First aid for each is markedly different.

If the victim is unconscious, with a red, hot, dry face and full, strong, rapid pulse, he is probably suffering from heatstroke or sunstroke. This condition requires prompt measures involving removal, if quickly possible, to a cooler and improved atmosphere, a body position with head and shoulders elevated, cold applications to head and body, loosening of tight clothing, and NO stimulation.

However, if the victim is unconscious or semi-conscious, with a pale, cold, wet face and weak and rapid pulse, common sense impels the use of considerably different measures. He is suffering from heat exhaustion and should also be removed to a safer atmosphere, if possible, but he must be kept in a level position, warmed as much as required, and given stimulants if possible.

Of these two widely differing ailments, the former (sunstroke or heatstroke) is usually the more serious. The bodily temperature must be reduced shortly and in both cases, of

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The victim of an injured spine should be rolled face down onto a blanket.

course, medical aid must be obtained promptly.

Heat cramps, usually in the muscles of the abdomen or limbs, are very painful. They may or may not be accompanied by the stated symptoms of heat exhaustion (pallor, coldness, clamminess, faintness, weak pulse, and so on). First aid is generally the same as for heat exhaustion, with hot applications, particularly on the abdominal region.

Just a word at this point about the use in first aid of liquid stimulants. Hot coffee, tea, milk, or chocolate may be used to advantage if at hand. The use of aromatic spirits of ammonia (a teaspoonful to a half glass of water) is effective. These or any other liquids must be given slowly, in small sips, while helping and cooperating with the victim to the utmost. But NO liquid of ANY kind may be administered to an unconscious person. Imagine your distress if a member of your household should try pouring a glass of water into your mouth some night when you are sound asleep! It should be obvious that real danger exists in trying to administer a liquid to a person who is unconscious and consequently entirely unable to swallow.

First aid stimulation for unconscious victims who are breathing (if stimulation is necessary) is effected by the use of such inhalants as "smelling salts" or aromatic spirits of ammonia.

Correct first aid concerns itself also with what NOT to do. It is true, unfortunately, that considerably greater harm than good is generally accomplished in fracture cases by the eager help of unthinking and untrained persons. The normal impulse to try to help another human in distress evidences itself all too frequently in hasty lifting by wrists and ankles, and in other improper and dangerous practices. The condition of a broken neck or back, so mishandled, can hardly fail to be seriously aggravated, with the vital nervous tissues of the

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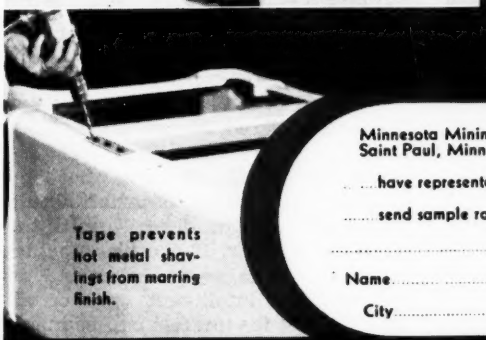

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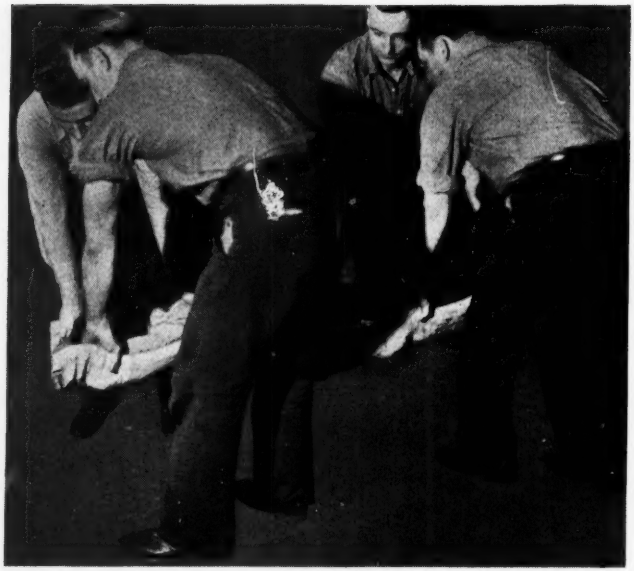


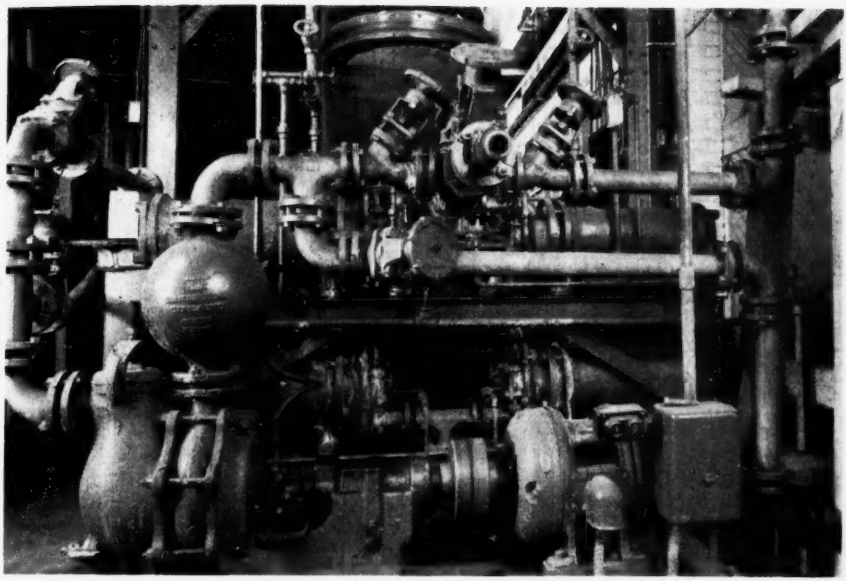
With the sides of the blanket rolled to afford a grip, the injured man can be lifted for transportation or to allow a stretcher to be shoved under him.

spinal cord injured or completely destroyed. It is simply appalling how frequently simple fractures are MANHANDLED into compound fractures, with all of their sharply-increased dangers.

"Dapper Dan," a millwright with a fine record of loyal and intelligent service, slipped from a catwalk to the floor, falling nearly 20 feet. The sympathetic hands of friends loaded his limp form onto an electric truck and rushed him to the plant hospital. The doctor discovered a skull fracture, among other injuries, for which the principal treatment was absolute rest and quiet with the head somewhat elevated and cold packs applied to it. Today Dan's friends are wondering to what extent they must blame themselves for the meaningless mental wanderings of their former fellow-workman.

When a man has fallen from a ladder or scaffold or has suffered some similar casualty which has injured his spine, he should carefully be rolled — not lifted — onto a blanket that has been spread as close to the victim as possible, and placed face downward. Care should be taken that all parts of the body are moved simultaneously. When this has been done, the side edges of the blanket are rolled to provide a good grip and the blanket can then be lifted so that a stretcher can be slipped into position under the patient or, if no stretcher is available, the victim can thus be carried into the hospital.

In presenting the few facts given here, the writer wishes it definitely understood that this discussion is not to be considered as an abbreviated course in Red Cross First Aid, but rather is intended to give the shop executive some idea of what should be done — or not done — until the physician arrives. If the plant or department manager is interested in planning for intelligent care of all injury cases, his interest can be manifested by arrangement to have thorough first aid instruction given to several picked men from each plant department. The American Red Cross, through its 3,700 chapters, will do all possible to cooperate.



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Barrel Finishing of

The Application of Leather In Barrel Finishing Procedure.

By H. LEROY BEAVER

Barrel Finishing Consultant
Lansdale, Pennsylvania

THUS far in this series covering the barrel finishing of metal products, no mention has been made of leather and the part it plays in the carrying out of various processes, and yet when the selection of leathers for such application is properly made and with a full understanding of the requirements it becomes a most useful product in many phases of barrel finishing practice.

Most of the readers of this series, of course, will immediately understand what we refer to when we speak of a sheepskin wheel used on a buffing lathe for the production of various finishes, but for those not familiar with this type of wheel we might say that such wheels are built of succeeding sections of leather, preferably sheepskin, until the desired wheel thickness is acquired, after which they are used in much the same manner as built up sections of cloth wheels.

Now a barrel finishing operation in which leather in some one of its most acceptable forms is used is intended not to replace polishing operations with a lathe, but for application on parts that would be either extremely difficult if not impossible to handle on a sheepskin wheel, by units, that is to say, one part at a time.

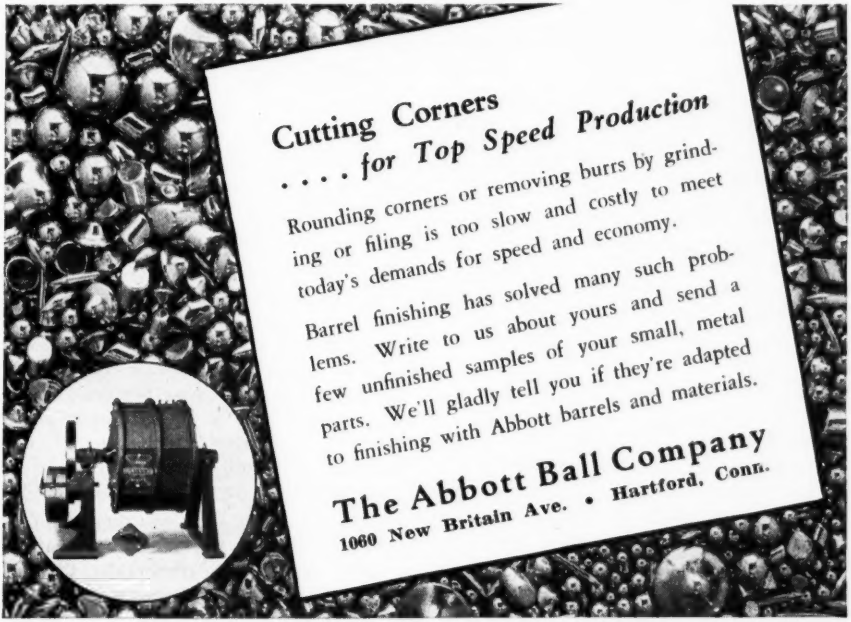
In the attempt to apply leather to such processes many expedients have been tried, and for the most part without any spectacular degree of success, probably for the reason that most anything in the way of leather, irrespective of its properties was thought to be satisfactory or to "do" for the job, and in this we have many examples of the same sort of fallacious reasoning in a circle that we meet with in other attempts to do the unusual or extraordinary in the way of barrel finishing procedure.

Of the many leathers that have been attempted to be used, we might mention sheepskin scrap, calfskin scrap, walrus hide scrap, the trimmings of oak tanned leather shoe soles which would be a waste product in shoe factories and the offal or trim accumulated in the production of what are termed chamois skins. As to the form in which such leathers were attempted to be used, they run all the way from attempts to cement leather linings in the barrel it-

ng of Metal Products

self to grinding such leathers literally into a powder in an attempt to apply them somewhat in the same manner as sawdust, ground corn cobs and like media are now used.

A matter of about twenty years ago someone, identity now unknown, sounded off in print on the great advantages to be derived from the use of what was termed "leather meal" in barrel finishing practice. In the light of later understanding we now know, of course, that this is the very least desirable of all of the forms in which leather can be used in barrel finishing practice. It is not unusual today to find in some plants here and there an attempt to use chamois skin ground into a meal, sometimes mixed with equal parts of sawdust or some other medium. It is only in isolated cases where such applications work out satisfactorily because chamois skin from the very nature of the tanning procedure does not lend itself nearly so well to barrel procedure as do other more suitable leathers.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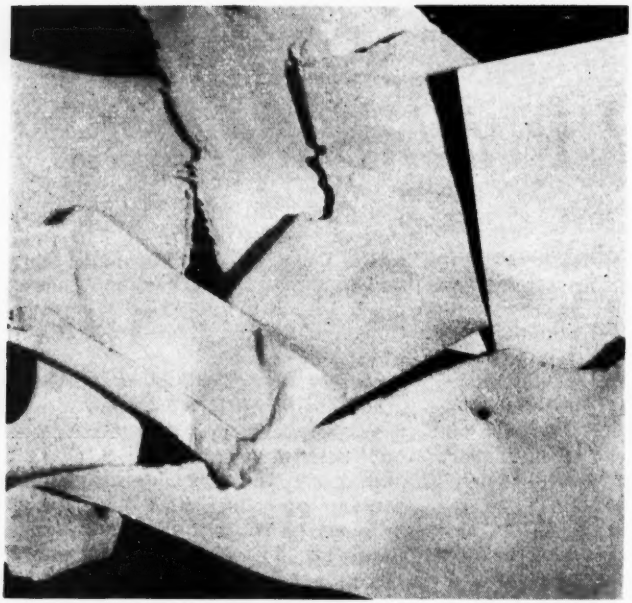

Fig. 1—Sheepskin Leather Scraps

In any event, and not only with chamois skin meal, but with other leathers reduced to the meal stage, the difficulty is that they powder badly, clog into angles or grooves of the parts being finished where they are mostly difficult to remove, and where we have any more than ordinary degree of porosity of the metal parts being finished fine particles of leather dust will lodge in the pores, only to crop up in the form of trouble later and usually, most unfortunately, after the product has left the manufacturer's hand and found its way either to dealer or eventual user.

In a rather long series of experiments conducted down through the years, we have finally selected three forms of leather for barrel finishing application that we would consider to be the most satisfactory and in order of their value we would briefly describe them in the following order:

1. Regular tanned sheepskin scrap such as one would find as trimmings or residue from such leather parts as suspender trimmings, scrap from belt manufacture, or from most any scrap accumulation from industries wherein such tanned sheepskins are used. The natural colored scrap is preferable to scrap from dyed or colored skins.

2. The scrap from calfskin which is sometimes called "skivings" and which derives from calfskins which are split so that the wearability of calfskin can be obtained without its thickness, an illustration of which would be a form of leather known as "skiver," which is largely used in bookbinding. At times such leather is also known as "split" leather, and it is the discarded part of the leather that is referred to.

3. A type of leather generally oak tanned and intended solely for the production of leather belting. The part of such hides known as "rands" are chopped into small pieces averaging from 1¼ x ¼ in. to ½ x ½ in., and naturally the source of supply for this type of leather would be manufacturers of leather belting.

In practically all of the applications of leather, save one, the leather is used dry, but to undertake to enumerate all of the materials used or

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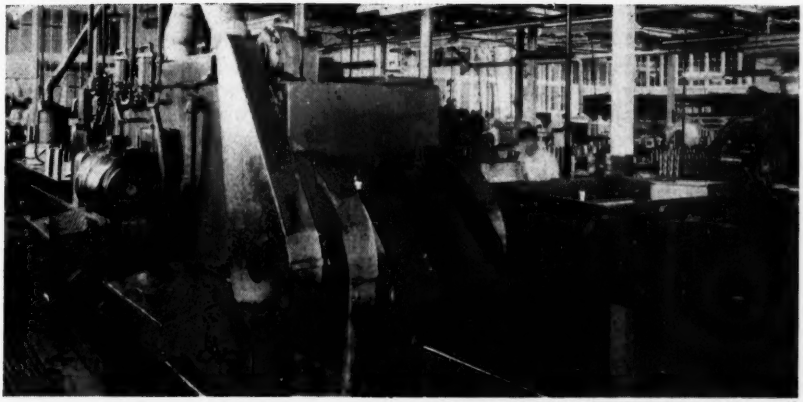

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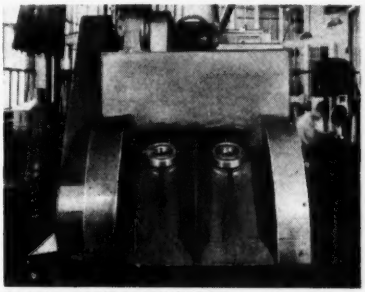

Discharge End—tripod fixtures pass through slots in aprons which automatically strip off the bearings and deliver them to the inspection table.

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at one time attempted to be used would be too long a story. The single exception where leather is used other than dry is in cases where the barreling operation is for very small and delicate parts where there is a problem of removal of burrs, or where it is desirable to round off square edges and get as nearly as possible a suitable radii without the removal of too great a surface area. In such an application the leather that we have heretofore referred to as chopped rands is largely used and functions most satisfactorily. Such leather, in the desired proportions is first soaked in what we might term a "light" oil, such for example as high test kerosene. It is then permitted to dry out just to the point where it will hold against its surface some light abrasive material such as rouge.

In other words, the leather is used as a carrier for the abrasive and to hold it in suspension in the burnishing mass where it could not be maintained if used in its normal or dry state. Many needles, as an example, are barrel ground by a method somewhat similar to the above. When used in this way the barrels as a rule are comparatively small as are the loads both of leather used as the mass, and of the parts to be finished. Due to the very fine nature of abrasives used in this way the operations are longer in the carrying out than in most other forms of barrel finishing procedure, but leather, due to the fact that it exercises no blunting effect on very delicate parts is an almost admirable barrel finishing material.

Now as to the applications of leathers as described under specifications 1 and 2, the applications are legion and it would be impossible to describe even a small part of them in the space available and inasmuch as this series is now drawing rather rapidly to a close we do not wish to devote but a single paper to the discussion at hand.

We have previously written at some length on the barrel finishing of hardened steel parts, and we believe that if we detail at some length the procedure used on such parts and where leather plays an important part, that the reader will be able to judge largely for himself whether leather could also play an important part in his finishing procedure. For this purpose we shall select a steel ball

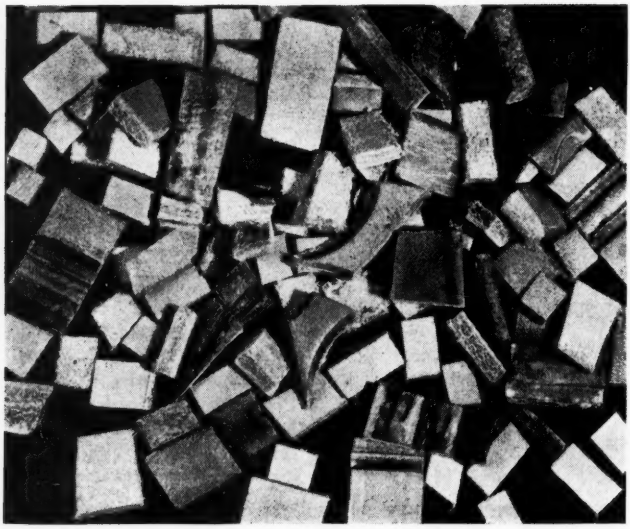

Fig. 2—Oak tanned Leather "Rands"

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As a cleaner, Sunoco Spirits is always uniform in quality . . . always ready for instant use. Its high solvency enables it to penetrate the minute pores of the metal, quickly rid them of oil, grease and dirt and leave the surface sparkling clean . . . ready for painting or plating.

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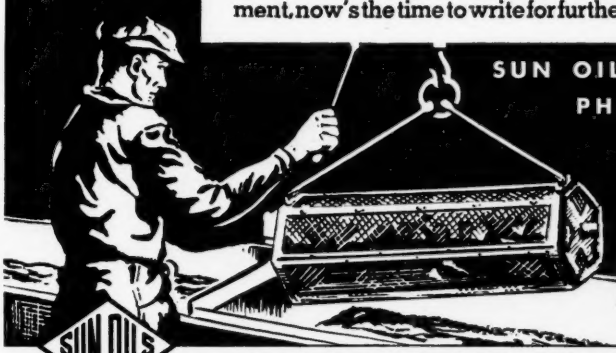

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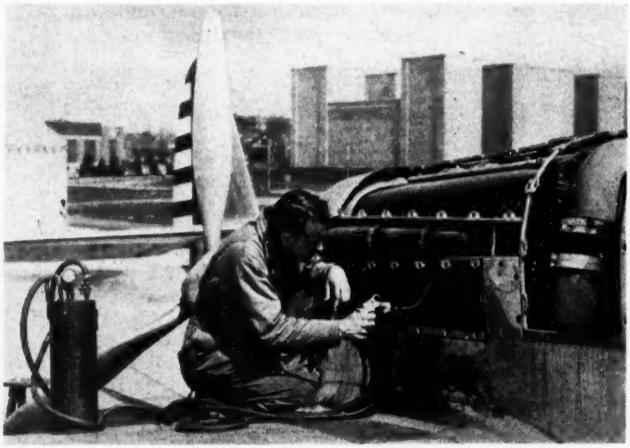
such as is used in radial and thrust ball bearings. These parts are very often erroneously termed "ball bearings," but they are not bearings, but simply balls.

As to the manner in which such balls are formed in the first analysis we will pass over because the first formings are not especially indicative of anything, whether the parts are hot forged or cold pressed, and this is true as well of steel parts that are heat treated and finally brought to a high luster finish.

Let us say that we have brought the ball to its final grinding stage, that is, as far as we generally go with machine procedure where grinding wheels are used. We now have a rounded blank, generally very rough and from this point barrel finishing procedure is used right down to the completion of the ball.

First, the parts are operated under considerable load and with suitable abrasives to further reduce surface area, and because they are rounded in the machines, they do not lose their true sphericity in any subsequent barrel finishing operations. Sometimes as many as three or four such barreling operations are used before the balls are ready for their final operation. Each succeeding operation used a finer and more friable abrasive material until we come to the last operation which would be performed with some such medium as vienna lime. This is a very slow cutting medium and to illustrate this, we might say that even on steel balls of ½-in. diameter, it requires continuous operation of from eighteen to twenty-four hours to remove as small a part of the surface area as from .000075 to .0001 in.

When such final abrasive or lime treatment is used the lime is first washed completely from the barrel, and barrels for this work are invariably of the high and narrow type with lids on either side of the barrel so that a strainer can be placed on one side and then water flushed down through the mass until it runs clear. Either that method is employed or one shaft of the barrel is drilled so that water can be introduced into the barrel through the shaft in which case only a single lid with a strainer



Spray painting equipment is used to prepare military fighters by spraying protective and decorative coatings both inside and outside the planes, by spraying of non-reflecting paints on nacelles and propellers to prevent glare, and the application of sound deadeners inside fuselages to kill motor vibration. The engine of this fighter plane is being sprayed with an anti-corrosive compound containing castor oil.

(Photo Courtesy DeVilbiss Company)

cover is required.

After the lime has all been removed, the barrel is charged with warm water to which a tallow base barrel finishing soap is added, and this operation is intended to remove the last traces of lime finish from the surface of the balls. This being done, the balls are removed from the barrel, dried either in a sawdust riddle or oblique wood barrel or special cleaning machine and they are now ready for the final or buffing operation, and it is in this operation that leather is used.

Hard maple oblique tilting type barrels are as satisfactory and perhaps a bit more so for this operation than any other type. The operation is simple and involves first placing in the barrel about half a bushel in bulk of sheepskin or skived calfskin leather scrap, cut into pieces of anywhere from three to ten square inches in size. The balls are then added on top of this leather mass. When the barrel is placed in operation the leather does not float on top of the mass as would sawdust or other media that is of lesser specific gravity than the parts being finished, but due to its irregular form, it is pinched between the parts and the periphery of the barrel and in this way is carried around through the mass where it acts as a dry buffing medium in exactly the same manner as would a sheepskin wheel when operated against a part without any abrasive material.

The finish is largely frictional, and inasmuch as this series is being written solely for those interested in barrel finishing procedure it is assumed that they are, at least in large part, familiar with the appearance of a new shipment of steel burnishing balls or forms just as they come from

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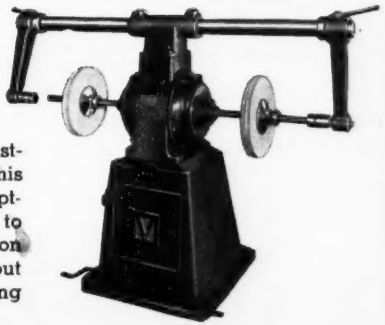

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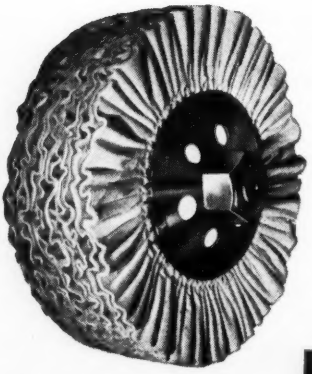

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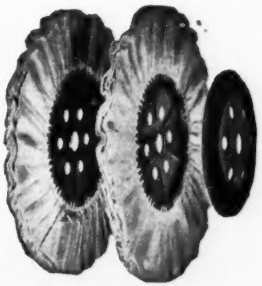

F CORPORATION

LONG ISLAND CITY, N. Y.

nd City York, has rights to U. S. Patent Nos. Re 19,894 and 2,140,208 ving m the admission of air through the sides of the buff. Owner ect all nd stop infringement.

the factory, and the leather buffed barrel finish we are speaking of produces a finish identical with the high mirror finishes that will be seen on such new steel burnishing materials.

The average reader familiar with this type of finish need not stretch his vision very far to be able to visualize what his own hardened parts would look like if they were properly leather burnished. There is a wide variety of parts, especially in steel, that are considered to be "good enough" following the regular barrel finishing procedure with its final drying in sawdust or corn cob meal, but if we go from there to a barrel buffing operation wherein a suitable leather is used, the final finish will have something more closely resembling a personal touch, or rather may we put it as a soft limpid luster that very often will prove to be well worth while where the "over the counter" appearance of the part is so helpful in effecting sales.

It is not to be supposed that leather buffing in barrels is only applicable to hardened steel parts. The process can be used as well on parts made from most any of the nonferrous metals or to parts made of say steel and variously plated in any of the more popular metals used in plating procedure.

When leather buffing is used, it is never to be attempted as the sole barrel finishing operation, but as an auxiliary or extra operation to enhance the character of the final finish and give it just that extra touch that carries it above the run of mill barrel finish.

To undertake to present illustrations of these leathers is somewhat difficult, but illustration Fig. 1 will give at least a rough idea of leather scraps as described in number one, these being of sheepskin and also so closely resembling the calfskin skiving leather that one illustration will suffice for both leathers. The illustration Fig. 2 is indicative of the appearance of what we have described in number three as "chopped" rands.

Pangborn Unit Type Dust Collectors Bulletin 907. A new bulletin designated as No. 907 is now being issued by Pangborn Corporation, Hagerstown, Md., describing Unit Type Dust Collectors. Unit Type Dust Collectors are shipped completely assembled ready for attachment to individual machines such as grinders, blast cleaning units, tumbling mills—in fact, almost any kind of process equipment that creates dust.

In the Unit Type Collector the cloth screens are made in banks over wooden frames and these banks are mounted in steel casings. Banks are detachable so that replacement units may easily be inserted.

A unique feature in the series is the portable unit mounted on wheels. This complete unit may be easily transported from place to place and connected to various types of equipment as needed. A removable dust drawer acts as the hopper. When Collector is emptied it is only necessary to pull out drawer and dispose of contents.

Pangborn Corporation also builds the large Type "CH" All Steel Frame Cloth Screen Collectors for any size installation.

Copy of Bulletin 907 free upon request.

"Keystone Negative Temperature Coefficient Resistance Material" is the title of a new folder being issued by the Keystone Carbon Company, Inc., 1935 State St., St. Marys, Pa., in which is described a material whose resistance is said to decrease with rising temperature. Resistors made from this material are used to reduce or eliminate initial current surge in electrical equipment, to compensate for resistance changes due to temperature variations, and to provide various degrees of time delay in electrical units.

The last page of the folder contains a curve which indicates the resistance in ohms at temperatures from 10 to 160 deg. C. for a resistor made from one type of this negative temperature coefficient material. Copies of the folder will be sent free upon request.

Mention PRODUCTS FINISHING when writing to advertisers. Your cooperation will be appreciated both by the advertiser and this magazine.

BAN ON COATING METALS FORCES QUICK SUBSTITUTE

Important information for executives who must find a suitable replacement--quickly for galvanizing or other metallic coatings.

WITH today's shortage of protective coating metals; zinc, tin, cadmium, and nickel, plant executives are facing immediate abandonment or at least careful conservation of them for only the most vital uses. Baked organic finishes hold the most reliable promise of permanent availability, and these can become an acceptable substitute only when the baking process is conducted under proper conditions. In this connection, Morrison experience dates back many years and into the hundreds of successful paint and japan drying oven installations.

Briefly, here is what Morrison ovens offer you in the present emergency: (1) Moderate price based on offering standard units. (2) Prompt delivery due to this standardization plus the fact that materials are ready for immediate construction. (3) Foresight will be used in making oven recommendations so that they will have future productive uses when coating metals are again available. (4) Advice on material handling will be gladly given, based on wide experience in this problem. (5) Morrison ovens are outstanding for their uniform heat, precision control of both temperature and atmosphere, and correct ventilation, which are all necessities in good baking results. (6) These ovens have high fuel economy with either oil or gas, and occupy small space in proportion to their output.

We are prepared to give you the prompt service and intelligent cooperation the present situation requires, and urge that you get in touch with us immediately.

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5005 EUCLID AVE. CLEVELAND, OHIO

Modern Gold Plating

By JOSEPH B. KUSHNER, CH.E.
Metal Finishing Consultant
New York City

FROM time to time we get letters from manufacturers and platers who want to know whether the things we preach about modern gold plating are actually practiced commercially. The answer to this is an unqualified yes; more and more plating plants are adopting the scientific, up-to-date approach advocated in this series. Unfortunately, and for obvious reasons, the owners of some of these more modern gold plating rooms object rather strenuously to having their plant's innard exposed to a lens so we cannot bring to our readers photographic proof of the pudding, as often as we would like to. On occasion, however, when we request the privilege of being able to take a couple of pictures of a modern gold plating plant in operation, we get yes for an answer and this is such an occasion. Through the courtesy of the management of Mazer Brothers, Inc., Manufacturers of Costume Jewelry, New York, we were fortunate in being able to take and present here a series of photographs that give a fairly good idea of what makes things tick in this particular plant's recently designed and highly efficient gold plating room.

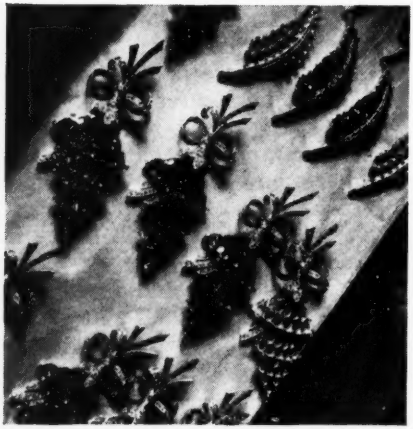

Fig. 1—Costume jewelry finished in the plant described herewith

The merchandise manufactured by this company is white metal rhinestone and non-rhinestone costume jewelry of the better grade, as shown in Fig. 1. After the cast metal is polished, as shown in Fig. 2, the work while resting on fiber trays, is passed from the polishing room into the plating room shown in Fig. 3. The plating room is completely separated from the polishing room and the only means of direct access between the two is through a cupboard with clear

Part 13

glass doors opening on both rooms. Convenient shelves permit the polishers to place trays of finished work down for the plater to pick up. When not in use the glass doors are kept closed and thus dirt and dust from the polishing room is kept out of the plating room.

After coming into the plating room the work goes to one of the steam and ammonia "tents," a view of which is shown in Fig. 4, where the last trace of polishing rouge is removed by the liberal application of soap and ammonia followed by steam gun and sprinkler. Air is exhausted from each of these "tents" at sufficient velocity to keep the operator comfortable.

The work, dried in a convenient warm sawdust bin adjacent to the steam tents, is replaced on the trays and handed to the rackers shown in Figs. 5 and 6. Small work is strung on wire while larger pieces are hung from racks. At the present time these racks are not insulated but they will be in the very near future. The racked work is now ready for plating.

•

The source of power for the plating tanks is a 3 phase, 200 ampere, 6 volt, commercial type of plating rectifier. Fig. 7 shows this instrument which supplies the current for some 12 tanks in the plating room.

The plating cycle starts with a 30-second cathodic cleaning treatment in a six-gallon tank of proprietory cleaner. A view of the plating department is shown in Fig. 8. A thorough hot water rinse and a 30-second flash of cyanide copper follows. Now comes another thorough hot water rinse and the work goes into a 150-gallon bright nickel tank shown in Fig. 9 to be plated for 10 to 15 minutes, depending on the size and type of work. It is of interest to note that well-constructed ducts exhaust the fumes in the vicinity of the cleaner and the cyanide baths, as shown in Fig. 10, leaving the plating room free from odors and thus comfortable to work in. As can be seen, the room is quite light, but on dark days overhead fluorescent fixtures give the plater adequate light with which to examine his work.

Fig. 2 — Partial view of the well lighted and ventilated polishing room

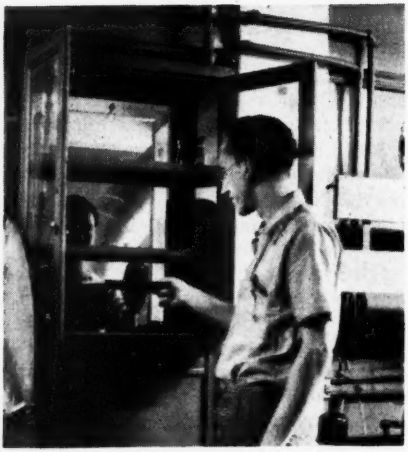

Fig. 3—Transferring polished work from polishing room to plating room

After the load is removed from the bright nickel it is rinsed well in running cold water and is given a minute and a half rhodium plate plate or a 60-second gold flash, depending on what finish is desired. The color of the gold deposit is rigidly maintained by accurate chemical analysis of the bath and the timing is controlled by a sweep second hand in full view of the plater. The work is now rinsed again and is dried in a hot air blast dryer shown in Fig. 11 placed on tissued trays and carried into the stock room for inspection under daylight lamps. If satisfactory, it goes into stock or is shipped at once.

Those pieces that are to have a two-color effect go to the stop-off room, a large room with north light studio lighting, where a staff of skilled girl workers shown in Fig. 12 apply stop-off lacquer to the pieces as required by the design. After the lacquer dries on the work, the pieces go back to the plating room, as shown in Fig. 12, where they get a final plate of gold of another color. The stop-off lacquer is now removed as shown in Fig. 13. This is a hand operation, since ordinary thinner dipping does not remove lacquer tenaciously lodged in crevices between stones. The work is then cleaned in a special mild alkaline cleaner, well rinsed in running hot water and dried in the air blast dryer. The finished work now goes to the stock room for final inspection and shipment.

Even a cursory examination of the photographs shows how clean and light the plant is, and the application of the most modern and up-to-date equipment. The contrast between a plant of this type and some of the older ones you may know of or have read about in this series, is truly startling. Yet it may be asked, "Is the use of such modern equipment worthwhile from the standpoint of production costs?" The answer to that one is another question: "Is the horse and buggy more efficient than the modern automobile?" The answer seems pretty obvious though

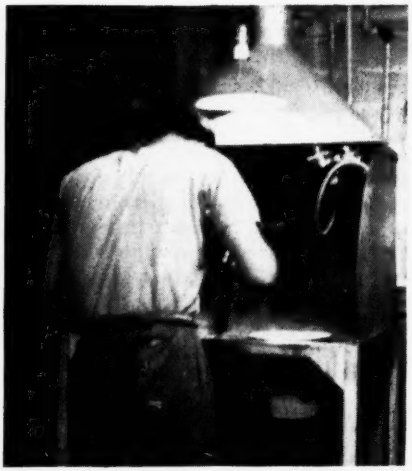

Fig. 4—Ammonia "tent" used in removing polishing rouge. Note ventilation.

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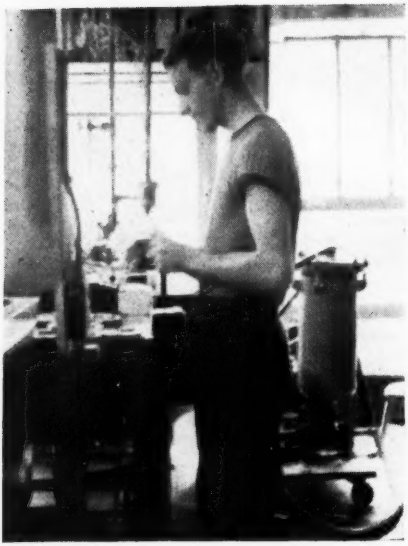


Fig. 5—Racking large pieces for plating. Note mobile filter pump in rear.

there are plenty of old-timers who are still producing gold plated wares in horse and buggy fashion, when streamlined methods are within easy reach. This brings us to one of our pet topics:

Planning the Gold Plating Plant

It is truly surprising how little thought is given by management to the planning, layout and arrangement of a gold plating plant. Efficiency, time, money and labor savings are often foregone because of desultory planning and lack of information on the part of the party responsible for the job.

•

Too often, the average size gold plating plant is a slapped together product. And sometimes the gold plating plant is like little Topsy—"it jest grows."

If you have the temerity to point out to the proprietor of one of these outfits that the set-up seems inefficient, the usual reply is: "I get the work out of it—that's all I want." Peculiarly enough, if you pointed out to this same man an idea or arrangement that would increase efficiency or reduce costs in his office, he would jump at it, or at least listen all ears, but there seems to be an inexplicable aura of hocus-pocus about the plating operation that makes him happy to be able to get any results at all, and any suggested improvement for a going gold plating plant is usually received with something less than enthusiasm.

A rather amusing case of plating plant planning that illustrates to an exaggerated degree lack of foresight in design came to the attention of the writer the other day. The writer was called in by a small novelty jewelry manufacturers to mix up some solutions for the tanks this gentleman had just set up. The manufacturer, who had had some training in science, conceived the arrangement himself, and to say the least, it was quite original. His idea was this:

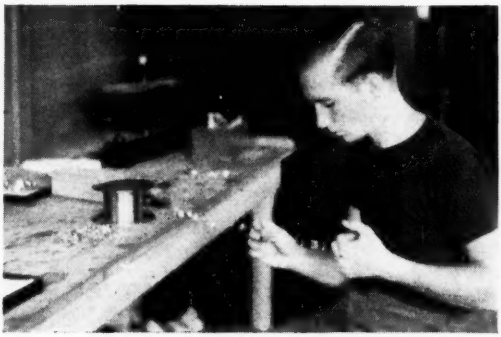
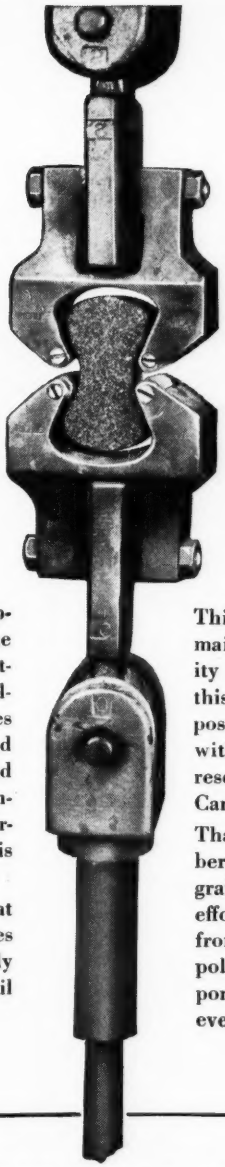


Fig. 6 — Stringing small pieces for plating. Note scale and weights in background used for making accurate weighings of plating chemicals.

THESE JAWS

TELL THE TRUTH ABOUT POLISHING GRAIN . . .



THESE jaws are part of the apparatus regularly used by The Carborundum Company for testing the "Surface Tenacity" of polishing grain. Briquette test pieces made of polishing grain in glue and water are inserted in the jaws and pulled apart to determine their tensile strength. The degree of "Surface Tenacity" or glue adhesion is proportionate to this strength.

As a result, you are assured that every batch of grain which reaches you will adhere quickly and evenly to the wheel and hold firm until its full quota of work is done.

This test is one of many used to maintain the unvarying high quality of the abrasive grain made by this company. Such standards are possible only for a manufacturer with the "know how" and the vast research and plant facilities that Carborundum possesses.

That is a point well worth remembering. For today, when abrasive grains are being used in our defense effort for thousands of vital jobs from finishing propeller blades to polishing lenses, quality is more important than ever before. CARBORUNDUM ABRASIVE PRODUCTS

THE CARBORUNDUM COMPANY • NIAGARA FALLS, N. Y.
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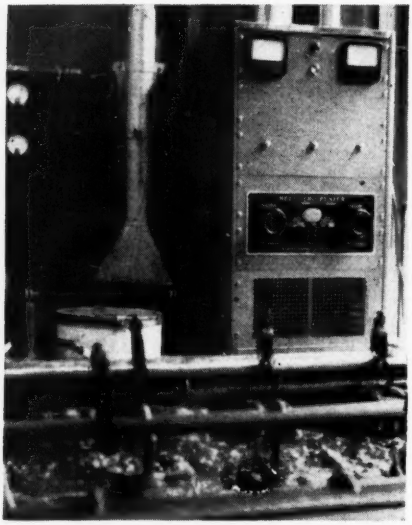


Fig. 7—The electrical heart of the plating room; a 3 phase, 6 volt, 200 ampere Selectroplater

He put four rectangular 18 x 12 (cross sectional area) tanks, one for a cleaner, one for copper, one for brass and one for gold, on angle iron supports and placed them in the form of a square with a distance of approximately six feet between each tank. Two heavy busbars, supported by two by fours, braced to each tank, ran around the square at a height of approximately six feet, making it necessary for anyone above that height to stoop in order to enter the plating arena. Between the cleaning tank and the gold tank he had a racking table and a sawdust drier. The diagram shown in Fig. 15 gives an idea of the arrangement.

•

Fig. 8—The work is placed in the cleaner. Note the rinsing sinks behind the plating tanks.

As the manufacturer explained it, "the plater starts at the racking table with a rack or load of work, which he cleans in the cleaner, then moves around the square progressively from cleaner to copper to brass to gold, finally ending with the work in the sawdust and ready for another plating load from the racking table."

He wanted to know how we liked his arrangement.

"Quite novel," we said, "but how about rinsing facilities?" The architect of this epitome of electroplating efficiency was stumped, but only for a moment.

"Rinsing?, I forgot about that! But there's a sink over there." He pointed to a small wall sink something like six feet from the cleaning tank, in a straight line. "The plater can rinse them in that. No trouble at all."

It took pencil and paper to demonstrate that it it wouldn't pay to have the plater play "in and out the windows" with the plating tanks. A diagram as shown in Fig. 15 illustrates the reason.

Assuming that the flashing time in each tank is so short that it pays the plater to wait at each tank for the load, he would have to go approxi-

Smoothing out the rough spots on another Finishing Problem

AP GRIEF BUSTER No. 247
THE GRIEF Large plant had serious trouble rubbing down the filling coat on machine castings. Sandpaper filled up rapidly, left an uneven, scratchy surface.
GRIEF BUSTER Substitution of AP's exclusive New Process paper, open coat, at the suggestion of an AP Engineer resulted in saving nearly half of the sandpaper cost, increased work per man hour and gave a smoother, more even finish.

How AP Engineers "Bust" Sanding Grief!

Another actual case from "Grief Buster" files – solved by AP Engineering, backed by an AP Sandpaper line that includes the right coated abrasive for every sort of job! If you're not entirely satisfied with your finishing operations, why not call in the same combination for a consultation? We've saved hundreds of manufacturers thousands of dollars in reduced sandpaper costs – increased output – better quality work. We may be able to do the same for you. A word to your jobber will bring prompt action – or write direct to Abrasive Products, Inc., 509 Pearl Street, South Braintree, Mass.

JEWELOX-JEWEL EMERY-JEWEL GARNET AP INC. **JEWELITE-JEWEL FLINT-NEW PROCESS**

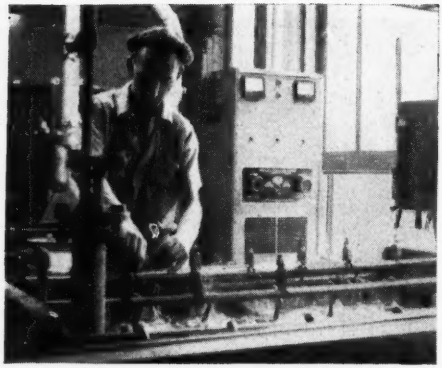


Fig. 9—The work is then placed in the Bright Nickel plating solution

mately 6 feet from the cleaning tank to the rinse. From the rinse to the copper tank about 6½ ft. along the shortest path, then back to the rinse, another 6½ ft., then down to the brass tank about 13½ ft. and back to the rinse tank for another 13½ ft., then down to the gold tank about 12 ft. and back to the rinse tank for another 12 ft., then back to the saw dust bin, about 10 ft. Adding the distances up we get a total distance of approximately 80 ft. that the plater has to travel in plating one load. If he has to plate 1,000 loads daily it would mean he'd be traveling over 15 miles on the stone floor every day.

Asked for our suggestion, we showed him the arrangement illustrated in Fig. 16. A little figuring on the same basis, shows that the plater travels in the course of a complete plating cycle only something like 8 ft., cutting down the plater's trek from approximately 15 miles to a mile and a half. A cut of over 88 per cent.

•

We explained that not only would the plater be thankful but that he would be less fatigued at a later hour in the day and thus capable of better work and that time would be saved on the plating cycle as well, not to mention the fact that less of the floor would get wet. As we left the premises we noted the manufacturer calling his plumber and electrician.

Though admittedly this odd case was the exception and not the rule, the fact that by a simple rearrangement, labor energy was reduced by over 88 per cent and labor time saved proportionately, points the moral that **it pays to plan the gold plating room.**

Manufacturers pay efficiency men fancy prices to come into their plants to show them ways for cutting costs and saving time and labor in every department, but for some reason or another, the plating room, particularly the gold plating

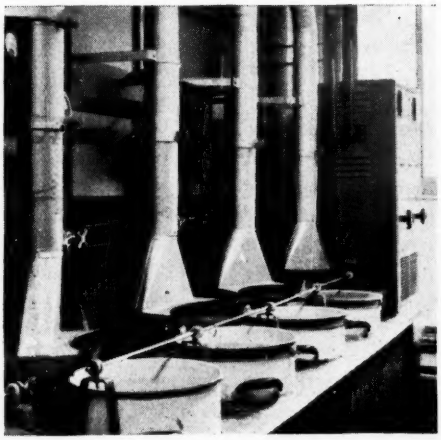
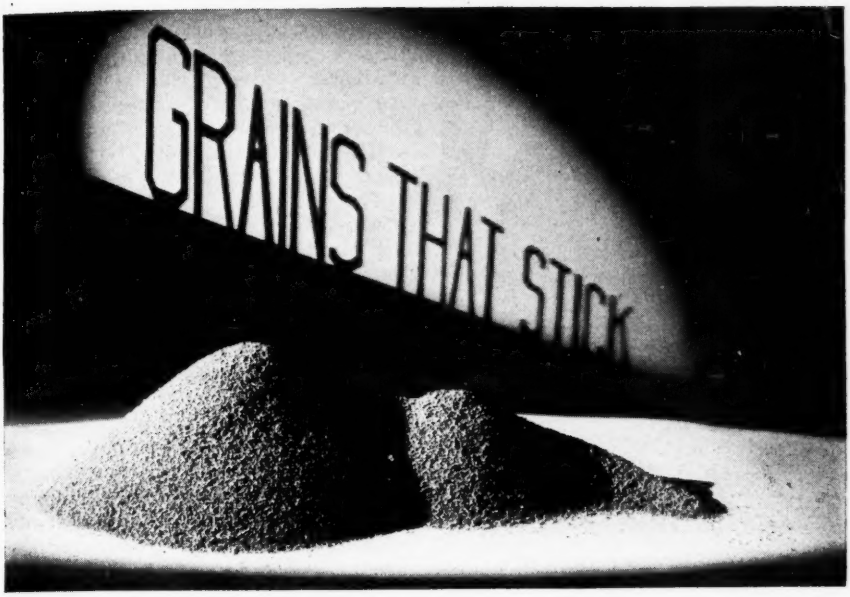


Fig. 10—Detail showing fume ducts used on cleaner and cyanide plating baths



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BECAUSE special treatments in the Norton manufacturing process increase the "sticking" power of Alundum Abrasive it is cutting polishing costs for many users. This ability to stay on the wheel head longer is just one of the plus features of Alundum Abrasive that result from progressive research combined with modern production facilities. It will pay you, too, to use Alundum Abrasive for polishing.

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G-110

NORTON ABRASIVES

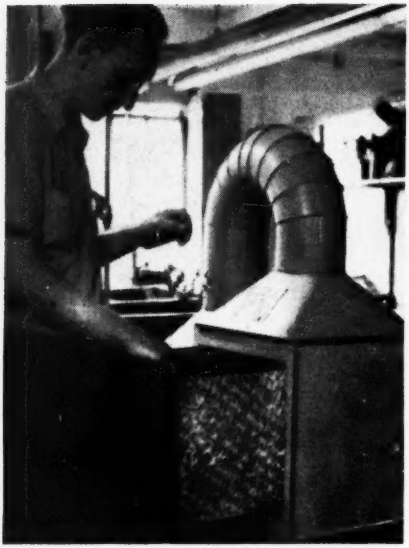


Fig. 11—Drying the work in the hot air blast dryer

room, is left alone. It is the last sanctum of the "gold old days," the final stronghold of "what-was-good-enough - for - my - father - is - good - enough - for - me."

Whether this is so because of the mysterious processes that seem to be going on, we do not profess to know. We do feel, however, that it is high time for the efficiency man to put on his boots and have a look at the plating room. If they can make production straight line, if they can arrange kitchens to make work in them less fatiguing and simplier, if they can shape cars and aeroplanes to use less power, then it is time they streamlined the plating plant.

Lacking the services of one of these expensive individuals, the manufacturer contemplating a gold plating plant installation can fall back on sound reasoning, pencil and paper and a bit of skull work, as outlined here.

The essential idea is planning a gold plating plant or any other plating plant for that matter, is to see that waste is reduced to a minimum, for reduction of waste is the essence of the word efficiency. We must look to reduce waste in four things:

1. TIME (labor, process).
2. ENERGY (labor, electrical, mechanical).
3. MATTER (materials).
4. SPACE.

If we can reduce wastage in any or all of these four, we automatically reduce production costs and increase profits.

Time

The reduction of time waste is probably the most important item of all. Time is limited to 24 hours per day. It cannot be purchased, produced or hired as with the other three factors and the only way time can be gained is by conserving it. How can time be saved? In planning your plating room, a number of questions

Fig. 12—Skilled girl workers apply stop-off lacquer to work

MEETS A VITAL NEED

There has never been a greater need for the National Metal Exposition & Congress than in this year of gigantic defense preparations. This National Exhibit affords the quickest and most satisfactory way to show thousands of defense producers the newest materials, processes, and equipment for speeding defense work in the metal industry.

Many of the 35,000 men who will attend the Philadelphia Exposition have found in the present emergency that they must specify and use materials with which they are not too familiar. At the Exposition these men can see on display and in operation the products of 275 leading manufacturers in the metal industry. Five days at the Show may save five months production time for the companies these men represent.

GOVERNMENT EXECUTIVES TO TALK

Sessions at the Metal Congress held in conjunction with the Exposition by four leading technical societies will be pointed toward defense production. Each morning a leading Government executive will discuss progress and requirements in Army, Navy and Aircraft production. In the afternoon, round-table sessions on various aspects of defense production in the metal industries will be conducted by armament experts. Societies cooperating in the Metal Congress are: American Welding Society, American Society for Metals, Wire Association, Iron & Steel Division and Institute of Metals Division, American Institute of Mining and Metallurgical Engineers.

EXHIBITORS PLAN BUSY WEEK

The records show that in 1941 more people than ever before are attending industrial expositions. Anticipating a crowd as large and influential as the 35,000 who attended last year's Metal Exposition, National Metal manufacturers plan an active and beneficial week during the Show.

Advance reservations are the heaviest in history; however, choice locations are still available at the regular $1.00 a square foot rate, so write, telephone or wire collect today for floor plan and full particulars. Address: W. H. Eisenman, Secretary, American Society for Metals, 7316 Euclid Avenue, Cleveland, Ohio.

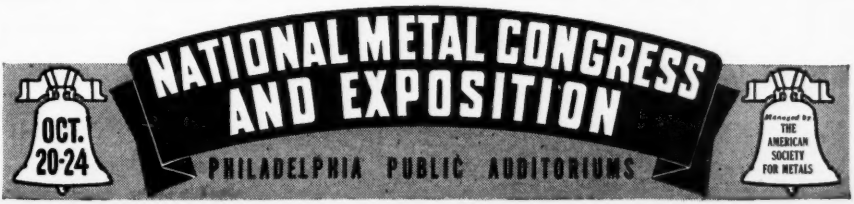


Fig. 13—The work is now plated with another color of gold.

must be asked and answered: Does the layout of the plating tanks make the plater consume too much time in transit between them? Is the plating cycle such that time gained at one tank is unnecessarily wasted at another? Does it pay to use high current density (high speed) plating processes? Can the plater employ idle time profitably? Consideration must be given to all these questions and others that suggest themselves with a little thought.

Energy

Energy in the plating room whether human, electrical or mechanical, should be carefully conserved. Reduction of fatigue in the plater brings about better work and conservation of the other forms of energy bring lessened power costs. In considering reductions in energy wastage, the following questions must be asked and answered:

Are tanks properly arranged so that the plater does the least amount of walking necessary? Are the plating tanks set at the right height? A difference of 6 in. in height in a series of 4 tanks, in which a 1-lb. load is plated means a difference of 2 ft. lbs. per cycle per load or a difference of 2,000 ft. lbs. of work per day if 100 loads are plated daily. Is the generator or rectifier right for the job, or is it too big or too little? Are busbars going to be too long in your contemplated arrangement? Are the tank rheostats correct or will they waste unnecessary power? Are they needed at all? Other questions will present themselves if you try to look for every possible way in which energy can be saved.

Matter

Conservation of matter is a factor that is extremely important today. Defense and priorities have placed all forms of essential materials at a premium and thus now there is a much greater incentive to save on this item than there was formerly. Under this classification come a number of items. Are the tanks of the proper materials so as not to cause any contamination in the solution and so as not to deteriorate themselves? Are they too large or too small? Are the solutions used efficient with respect to the materials in solution at their proper concentrations and not in excess? Or below par? Is allowance being made for recovery rinses? Are the wrong tanks being

Fig. 14—After dipping in thinner, stop-off lacquer is removed by hand

Announcing

the October Metal Show Issue *of* PRODUCTS FINISHING

The 1941 National Metal Congress and Exposition to be held in Philadelphia, October 20-24, will bring together thousands of metal fabricating and metal finishing shop operating executives. With the defense program highlighting the Show, this year's Exposition takes on added importance and significance.

The October Metal Show issue of PRODUCTS FINISHING will prominently feature this Show. Helpful articles on up-to-the-minute phases of metal finishing, along with floor plans of the Show, list of exhibitors, program details, and other features, will provide the October issue with added value and added interest.

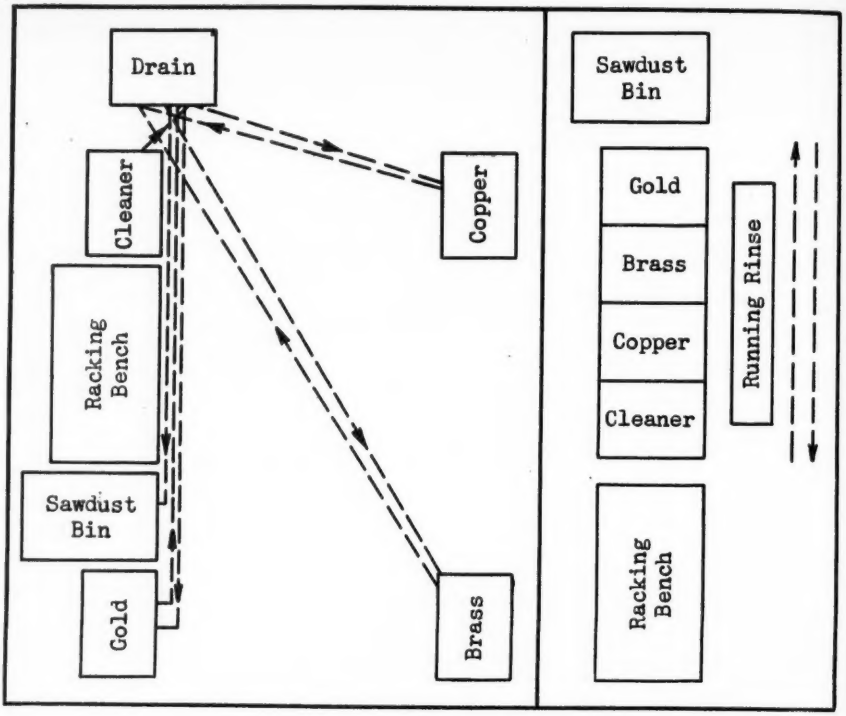
In addition to our regular circulation of over 16,000, extra copies will be distributed to visitors and exhibitors from our booth at the Show.

The extra value features of this October Metal Show issue offer PRODUCTS FINISHING advertisers the ideal vehicle to carry their messages to metal finishing executives at a time when equipment and supply increases are the order of the day.

Send in your advertising space reservation today.

PRODUCTS FINISHING

431 MAIN STREET • CINCINNATI, OHIO



Compare these two layouts. (Left) Fig. 15—Dotted lines show path of plater during plating cycle with old layout. (Right) Fig. 16—Dotted lines show path of plater during plating cycle with suggested layout.

placed adjacent to each other? If you place a cleaning tank too close to a gold plating tank, for example, you are obviously taking a chance on the contamination and deterioration of the gold solution by spray or accidental drip from the cleaner. If you place a cyanide dip or bath too close to an acid bath you may bring about rapid decomposition of the cyanide bath if the acid is volatile, or by accidental spray, not to mention the possible hazard to human health. Think hard and you'll find other questions to answer in your search for ways and means for reducing wastage of matter.

Space

Reduction of space wastage is the final item to consider. Often, in crowded urban and industrial areas it is the most important factor of all the three because here space is extremely costly and every square foot counts. The questions that come in here are: the area over which the layout is spread, is it too large? Are the tanks of the proper shape and dimensions so as to hold a given load and still conserve floor space? In the contemplated layout, will there be sufficient room for storage so that the aisles will not be cluttered up?

Other questions, not so obvious, await your digging.

All the questions we have enumerated above, can be answered if not completely, at least to a large extent, in your own individual case, whether you are planning a new plant, or rearranging the old one, by the use of pencil and paper and some clean cut thinking. Some people believe that theoretical discussion is all right in its place but when it comes to plating all you have to do is buy the tanks and plate. This unfortunately is not so. The writer has too often seen plating rooms in which the plater and his helper literally get into each other's hair, plating rooms in which the plater has nothing to do five minutes out of every ten because the tank size and cycles were incorrect, and plating rooms like the odd one mentioned earlier in this article where the plater had to walk something like 15 miles every day to do his job. So sharpen your pencil and take out your scratch pad and figure it out before you buy a tank or lay the floor. **It pays to plan the Gold Plating Room!**

The writer is deeply grateful to Mr. Sam Mazer of Mazer Brothers, Inc., for his cooperation and permission to publish the pictures presented here.

"How to Get Along With Less Priority Metal" is the timely and vitally important theme adopted by Metallizing Engineering Co., Inc., 21-07 41st Ave., Long Island City, N. Y., in a recent issue of Metco News. This 16-page book shows how it can be done with the metal spraying process, especially in the production and maintenance of rotating and reciprocating mechanisms. Many actual instances of unusual savings, not only in metal but in time and money as well, are described in detail and illustrated with photographs and diagrams.

Copy free upon request.

FIRST LINE OF DEFENSE!
Don't Let Rust Penetrate Your Paint Line
Just as armed forces are necessary to protect a country, so are PREP PRODUCTS needed to keep metal finishes intact and foil the invasion of rust.
METALPREP
Metal Cleaner and Rust Remover. Provides an ideal toothed surface for paint. Insures a firm bond to metal.
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A rust-inhibitive coating for iron and steel surfaces.
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Porcelain Enamel Institute Sixth Annual Forum

THE program for the Sixth Annual Forum of the Porcelain Enamel Institute which will be held at Ohio State University, Columbus, Ohio, October 8, 9, and 10, 1941, is rapidly taking shape. Wednesday morning, October 8th, the Product Standards Section Committee of the Porcelain Enamel Institute will meet to discuss the technical development of the past year. This committee will recommend the plan for technical research for 1942. R. R. Danielson, vice-president of the Porcelain Enamel Institute, will preside.

Wednesday afternoon will open with an address by Dean McQuigg, of the Engineering College of Ohio State University, and will be followed with remarks by P. B. McBride, president of the Porcelain Enamel Institute. R. M. King, Ceramic Engineering Department, Ohio State University, will preside. Following these talks, a symposium on spraying will be held. This meeting will discuss automatic spraying and low pressure spraying. Four prominent engineers from the industry have been asked to contribute their ideas and a general discussion by those present will follow.

Wednesday evening will be given over to other committee meetings.

Thursday morning a general session will cover screen process decorating and automatic pickling. Carl Harbert, of the Harshaw Chemical Company of Cleveland, will preside. There will also be a discussion of the man hours which are required for various operations in an enameling plant. The P.E.I. Research Fellow, William W. Coffen, will also report for this session on the work which he has carried on at the National Bureau of Standards during this year.

Thursday afternoon will be devoted to a symposium on job training for the enameling industry. Managers of several large plants will lead the discussion. E. L. Heusch, state supervisor of vocational trades in industry, will represent the Ohio State Department of Education at this meeting.

In the late afternoon an inspection trip will be conducted through the Ceramic Engineering Division of Ohio State University. Students will demonstrate a number of the ceramic processes.

In the evening a banquet will be given with the usual entertainment. At this banquet, C. L. Van Derau, manager of the Mansfield plant of the Westinghouse Electric and Manufacturing Company, will be the principal speaker.

Friday morning will be set aside for discussion of controlled atmosphere furnaces and the related problem of fish scaling. Also some additional discussion of clay will be held at this time. N. G. Wedemeyer, of Rohm and Haas, Incorporated, Philadelphia, will preside at this session.

Friday afternoon will be given to a symposium on operating problems, especially those problems bearing on securing maximum production out of plant facilities at the present time. The operating heads of some of the largest enameling departments have been asked to be present in order

to discuss this subject at length.

It is expected that an unusually large group will attend the Sixth Annual Forum due to the fact that considerable emphasis is being placed upon securing increased production from the present enameling facilities which are available in the country. Difficulties in securing additional equipment are making it necessary to run present facilities at full capacity.

The Deshler-Wallick Hotel will be headquarters for the meeting, but all discussions will be held on the Ohio State University campus.

The unusual growth of the enameling industry in the last year, showing production to be 50 per cent ahead of 1940 and at least double 1939, is making it necessary for many companies to concentrate on production problems. This fact was considered by the members of the Forum Committee in organizing the program for the Sixth Annual Forum of the Porcelain Enamel Institute and it was laid out with the idea that production problems should have the most consideration. It is expected that representatives of practically all of the enameling plants in the Middle West and of many eastern plants will be present.

The Uses and Limitations of Radiant Heat for Baking Organic Finishes. Practical finishers, interested in the radiant-heat, or infra-red, process of baking organic finishes, may obtain copies of a new bulletin on "The Uses and Limitations of Radiant Heat for Baking Organic Finishes," from Maas & Waldstein Company, maker of industrial finishes, 438 Riverside Ave., Newark, N. J.

The publication, written by G. Klinkenstein, vice-president and technical director of Maas & Waldstein, discusses conditions for the efficient use of radiant heat baking, finishes for use with the process, and other matters of importance to the finisher. Copies are available to users of finishes on request.

Announcing

IRCO ZINC COAT

The new five minute dip zinc coating

Zinc Coat is the base material for a hot, chemical-bath process of treating metal to produce a substantial, permanent, resistant, and insoluble film of neutral zinc phosphate on metal.

The zinc coating built up by the Zinc Coat bath is a foundation coating, not a finish coating. Three to five times longer life may be expected for finish coatings applied over a Zinc Coat treated surface and according to several weatherometer tests, Zinc Coat plus paint is equal to hot dip galvanizing.

Zinc Coat is highly absorbent and produces a perfect bonding surface over which to apply industrial finishes. Write today for literature giving complete details on Zinc Coat and methods of application.

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News OF THE INDUSTRY

Quaker Chemical Products Corporation Expands Manufacturing Facilities

Quaker Chemical Products Corp., Conshohocken, Pa., is expanding its storage and manufacturing facilities, increasing its floor space approximately 12,000 sq. ft. The additions will require an expenditure of about $50,000. Most of the new construction will be of stone, concrete, and brick.

The additional facilities are necessary to meet the increasing demands for its products by various customers, many of whom are actively engaged with government contracts of vital importance to the national defense program.

The new facilities, which are scheduled for completion by November 1st, will enable them to greatly increase production. In addition to the new buildings, new stainless steel stills, condensers and other equipment are being installed for the manufacture of resins and esters to take care of enlarged business along these lines.

Sparkler Manufacturing Company Occupies New Plant

Steadily increasing sales of its horizontal-plate filters have made it necessary for the Sparkler Manufacturing Company, Chicago, to expand its production facilities in new larger quarters, according to an announcement recently made by A. C. Kracklauer, president of the company.

After September 1st, the Sparkler organization will be located in its own factory at Mundelein, Ill. The building is on U. S. Highway No. 45 and provides approximately 10,000 sq. ft. of floor space for manufacturing operations. The new set-up, it is stated, gives the company a production area twice that of its former plant at 1210 Webster Ave., Chicago.

The Sparkler Manufacturing Company has been building a complete line of quality filtering equipment since 1928. This equipment features Sparkler's exclusive horizontal-plate construction, which, it is claimed, provides greater speed and uniform quality with economies in filter aids.

Fire Fails to Stop Paramount

In the midst of the heaviest business load in its history, with the plant loaded with customers' goods, in process and ready for shipment, with a back-log of orders that would require not less than three months to deliver, the plant of Paramount Rubber Service, Detroit, burned to the ground on the morning of July 4th. A total loss.

On Thursday, July 10th, the dip department was set up, ready to operate; on Monday, the 14th, the molded goods department was turning out production on defense orders; at the same time the sheet-rubber department was at work on the completion of one of the largest insulation projects in the country; in another week all departments but one, Rug-Kling and Filtomesh, were expected to be functioning . . . all in emergency or temporary quarters.

Mr. H. Tom Collord, president of the company, states that he never had ex-

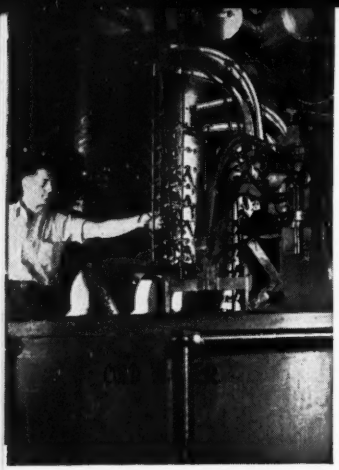
perienced anything to equal the loyalty, confidence and cooperation that have been demonstrated by the many customers of the firm, including some of the largest corporations in the country. Despite the urgency of many orders, the firm has not received a single cancellation. "The most potent way for us to express our deep appreciation of this loyalty is to again get under production at our new address, 10401 Northlawn, Detroit, Michigan."

Electrochemical Society Convention

Members of the American Electroplaters' Society have been invited and urged to attend the fall convention this year of the Electrochemical Society which will be held at Hotel Knickerbocker, Chicago, Ill., during the week of October 1-4, 1941. At that time, the Symposium of Electroplating will be presented at three technical sessions which will include papers and discussions of all the principles and modern practice in the electroplating field. This will be published in a separate volume of about 400 pages which will be offered for sale to the public at a low prepublication price, but the number of copies to be printed will be limited. Authors of the papers are outstanding authorities in their respective plating fields who have been kind enough to expend a great deal of time and effort, especially valuable in these trying times, to their preparation.

Following is the tentative list of subjects and authors: General Principles and Methods of Electroplating, Wm. Blum, A. O. Beckman, Walter Meyer; Brass, H. P. Coats; Cadmium, L. R. Westbrook, K. G. Soderberg; Chromium, G. Dubpernell; Cobalt, K. G. Soderberg, W. L. Pinner, E. M. Baker; Acid Copper, J. H. Winkle; Nickel, K. G. Soderberg, W. L. Pinner, E. M. Baker; Cyanide and Rochelle Copper, A. Kenneth Graham, H. J. Read; Bright, Fast Cyanide Copper, C. J. Wernlund; Gold, J. Kushner; Iron, C. T. Thomas; Lead, Wm. Blum, A. G. Gray; Rhodium, J. Kushner; Silver, N. E. Promisel, D. Wood; Alkaline Tin, F. F. Oplinger, F. Bauch; Acid Tin, P. R. Pine; Cyanide Zinc, R. O. Hull, C. J. Wernlund; Acid Zinc, E. H. Lyons; Alloy Plating, C. L. Faust.

METSO CLEANERS SUSPEND DIRT
Vital to electroplating is the cleaner's ability to free the metal surface from all dirt, grease and oil. Metso Cleaners do more than remove the dirt; they suspend removed dirt, preventing its redeposition on the cleaned surfaces.
This "suspending" action is a special function of the silica (SiO_2) content of the Metso Cleaners. May we tell you more about the role of silica in Metso Cleaners and how it serves in all kinds of metal cleaning?
PHILADELPHIA QUARTZ COMPANY
General Offices and Laboratory: Ionic & 3rd Sts., Philadelphia
Distributors in over 65 cities
Established 1831
METSO



New PLANT EQUIPMENT AND Materials

Udylite Barrel Plating Unit

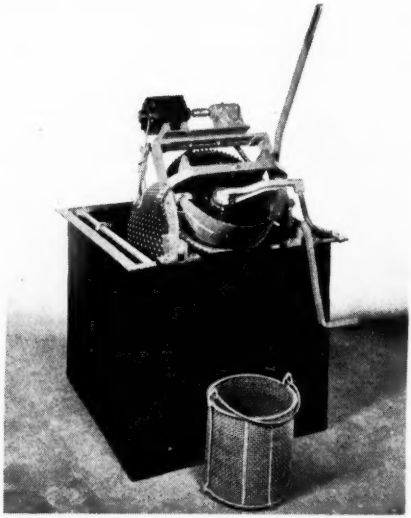
The Udylite Corporation, 1651 E. Grand Blvd., Detroit, Mich., manufacturer of plating equipment and supplies, has introduced a new barrel plating machine known as the "Multi-Purpose" Barrel. It may be used for a variety of purposes such as cleaning, drying, plating, rinsing, or pickling.

The Multi-Purpose Barrel is of rugged and efficient design and built with typical Udylite thoroughness. There are no bearings below the solution level. Removal of cathode contacts for cleaning is a simple, quick operation. The cylinder is roomy, permitting large loads. The Multi-Purpose Barrel is said to be versatile, as it will do everything required in the finishing of small parts, a real time and money saver. The Udylite Multi-Purpose Barrel is available in any combination to suit individual needs.

For cyanide, cadmium, zinc, and so on, plating or electrocleaning plain steel tank with anode rods and terminals; steel steam coil if necessary; steel, rubber covered cylinder with cathode contacts. Acid, nickel, and so on, plating; steel, rubber lined tank with anode rods and terminals; lead steam coil if necessary; rubber covered plating cylinder with cathode contacts. Tumble cleaning —plain steel tank; steel cylinder; steel steam coil. Pickling—steel rubber lined tank; Monel cylinder. Drying — plain steel tank equipped with unit heater; steel cylinder. Rinsing—plain or rubber lined steel tank; plain or rubber covered steel or Monel cylinder; steel or lead coil if necessary.

Specifications: Tank 32 x 36 x 30 in., $\frac{3}{16}$ in. steel welded inside and out, 125 gal. capacity; cylinder, 23 in. x 23 in. with 16 in. opening, built-in loading chute; capacity, 50 to 70 lbs., about one peck; perforations, $\frac{3}{16}$ in. standard, larger if desired; motor, 1/6 h.p., 110 volt, single phase, 60 cycle, a.c., cord and plug included.

All materials used in the construction of the Udylite Barrel Plating Unit are of the best grade and the workmanship is of the finest quality.

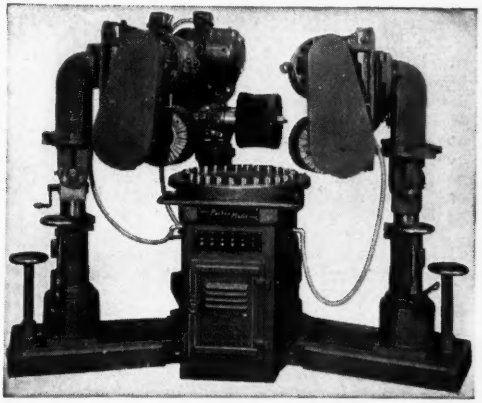


Udylite Barrel Plating Unit

•AUTOMATICALLY

INCREASED PRODUCTION

is today's most urgent demand upon Men and Machines — PACKER-MATIC meets this demand with Automatic Polishing and Buffing Machines.



PACKER-MATIC No. 424 Continuous Rotary Type.

Finished Automatically on PACKER-MATIC. SEND sample and finish required— time study gladly sent.

PACKER-MATIC

Build-up production and lower costs on difficult to finish parts are daily being accomplished by manufacturers in varied lines of industry. PACKER-MATIC has many exclusive features—Centralized Control, resulting in the saving of operating time—Consistent uniformly finished parts—Dependable performance. There's a PACKER-MATIC for your difficult to finish part.

•AUTOMATIC POLISHING & BUFFING MACHINES

Packer-Matic

THE PACKER MACHINE CO., MERIDEN, CONN., U. S. A.

Lewis-Shepard Toggle Type Barrel Dumping Harness

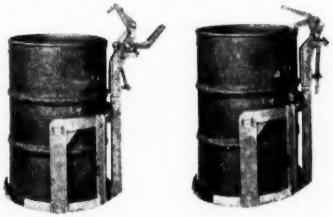
Lewis-Shepard Sales Corporation, 245 Walnut St., Watertown, Mass., presents a quick-locking harness to speed up and make more efficient the handling and dumping of barrels and drums.

Now it is possible to place a drum in the harness direct. No longer does the harness have to be affixed to the drum or adjusted to it. A standard type of Lewis-Shepard barrel hoop truck deposits the drum directly into the harness. Thus, the drum does not have to be placed on the floor first as formerly and one complete operation is eliminated.

The harness is equipped with a spring toggle, is arc-welded throughout, and can be made for any size of drum.

Plants which have considerable handling and dumping operations using barrels or drums will find this new, quick-locking, toggle-type, barrel dumping harness of great assistance in speeding up their work.

Used in conjunction with the Lewis-Shepard Master Dumping Stacker No. 7410 and the Lewis-Shepard Barrel and Hoop Truck, it provides a new three-way system which is said to be the most modern drum handling and dumping system on the market.



Lewis-Shepard Toggle Type Barrel Dumping Harness

In addition to this and other equipment for the handling of barrels and drums, Lewis-Shepard also manufactures lift trucks, portable elevators, racks, skids and special equipment to facilitate the orderly, rapid, safe and economical handling of materials.

"MAGIC" TACK RAGS
IMPROVE YOUR FINISH 100%

MAGIC TACK RAGS remove specks, lint and sand particles--- bring out that deep, smooth luster, produce a faultless surface for white or colored finish. Why use "home made" tack rags when you can buy MAGIC TACK RAGS at trifling cost! They are tackier, do not dry--- are dust-proof and spontaneous combustion proof. Packed in dozen and gross lots or more. Made only by the

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If your dealer does not carry Magic Tack Rags, write us for sample.

United Chromium Alkaline Copper Process

No special cleaning or activation prior to replating is said to be required with surfaces plated by means of a Unichrome Alkaline Copper Process which is now being marketed by United Chromium, 51 E. 42nd St., New York City. The Unichrome Copper Process is said to provide fine-grained smooth deposits. Surface is said to make excellent base for bright nickel and where buffing is required, results in easy flow and minimum wheel wear.

Alkaline copper plating bath is oper-

Want to Improve Your Paint Job?

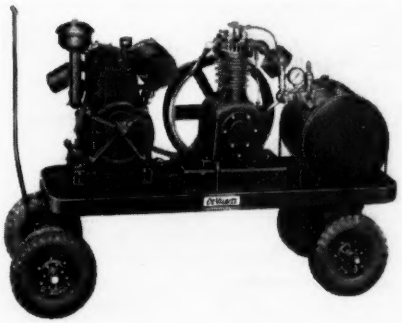
At no extra cost you can give your customers a better, longer-lived paint job. RUSTICIDE "50" not only cleans but also mildly etches and effectively rust proofs the surface. This inexpensive, non-toxic liquid is easy to handle, removes grease and rust, leaving an ideally toothed surface ready for immediate painting. Write us discussing your operation and we will send complete data. Rusticide Products Co., 3125 Perkins Ave., Cleveland, O. Est. 1920.

ated at temperatures of 100 to 140 deg. F. Current densities from 20 to 40 amperes per square foot at tank voltage of 1 to 2 volts are normally used. Solution is mildly alkaline bivalent copper one, operated at pH of about 8.5 electrometric. Chemicals are specially prepared salts, readily obtainable. No brighteners, wetting agents, or special activators are required. Bath contains no cyanide, making extensive ventilation unnecessary. The process is available under licensing arrangement.

DeVilbiss Portable Spray Painting Air Compressing Units

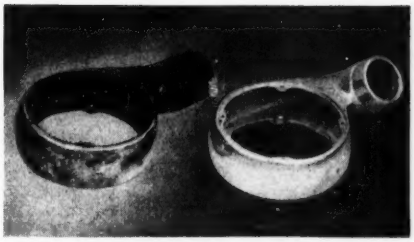
Two greatly improved series of four and six horsepower portable spray painting air compressing units, for operation of two and three spray guns, were recently released by the DeVilbiss Company, 300 Phillips Ave., Toledo, Ohio.

The units are said to be ideal for larger installations: in industrial and maintenance work, highway departments, public works, oil fields, mines, public buildings, and the like. Twenty assemblies are included in the two series — skid-mounted outfits, rubber-tired



DeVilbiss four horsepower gasoline engine driven portable air compressing unit for operation of two-gun spray painting equipment

and steel wheeled trucks, and two wheeled trailers. The six horsepower units may be had with or without an electric starter, and air or water-cooled engines are optional with this series. All six horsepower units have twin disc clutch as standard equipment. This permits starting of the engine independently of the compressor.



VACUUM CLEANER HOUSING

Before and after dip and pressure rinse in stage one of the Emulso-Dip Process. It is ready for lacquering without further cleaning. No hand brushing was required.

Here's a Time-Saving, Cost Shaving Method!

When you have to remove polishing compounds, chlorinated and sulphurized oils, smut, pigments and the like from metals prior to finishing—make sure they're gone —and without time consuming, expensive hand cleaning operations. The

MAGNUS
EMULSO-DIP
PROCESS

Is a simple, low-cost two stage cleaning method that insures completely dependable cleaning. The first step, a short dip and pressure rinse, gives you a physically clean surface, removing smut and other surface impurities without hand brushing. The second step, usually in an electrocleaning tank, gives you a chemically clean surface, ready for plating or other finishing operations. It will pay you to investigate this new process.

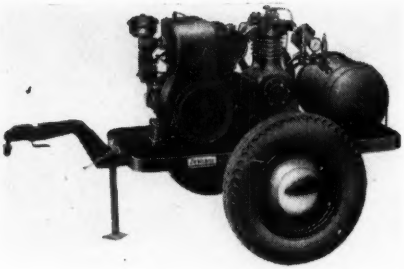
Write Now for Bulletin 3000

Magnus Chemical Co.

Manufacturers of Cleaning Materials, Industrial Soaps, Metallic Soaps, Sulfonated Oils, Emulsifying Agents and Metal Working Lubricants.

208 South Ave., Garwood, N. J.

MAGNUS CLEANERS



DeVilbiss six horsepower gasoline engine driven portable air compressing unit for operation of two- or three-gun spray painting equipment

Spray painting equipment for use with the outfits has been set up to be purchased separately from the air compressing outfits. Two-gun equipment is designated as type QM-6016. It may be used with any of the four or six horsepower compressing outfits. Three-gun equipment, for use with the six horsepower units, is designated as type QM-6017.

BLACK for Iron and Steel

Original, low temperature, patented method

One salt; one bath; one control; one operator. Protects and beautifies; lowers finishing costs; speeds production.

Ask for details. Sample JETALized free.

ALROSE CHEMICAL CO.
PROVIDENCE, R. I.

the JETAL process

Tectyl Rust Preventive Compound

Polar molecules are utilized in a rust preventive, known as Tectyl, for protection of metals against corrosion. Tectyl is now being marketed by Potomac Chemical Co., 605 Fifteenth St., N. W., Washington, D. C. Method makes use of fact that corrosion is essentially an electrolytic process in which wetted areas of metal subject to attack are anodic as compared with other cathodic areas. Polar characteristics of such compounds as fatty acids is employed to secure adherence of thin film to polar base surface for exclusion of moisture.

Tectyl consists of stabilized lanolin base which is dissolved with wetting agent, dispersing agent and inhibitor in hydrocarbon solvent. When applied to metal surfaces by spraying, brushing, dipping or flushing, these compounds produce thin adherent protective films which effectively isolate metal from moisture and hence corrosion. Since films are transparent, any incipient corrosion is easily detected. Solubility of film in common organic solvents permits it to be washed off when desired, although thinness of protective layer is such that its removal is often unnecessary. Treatment can be applied to iron, steel, copper, magnesium, aluminum, and their alloys, and it is claimed to offer better protection than heavy slush layers of grease.

Eastern Slow Speed Air Powered Mixer

A slow speed air powered mixer designed as a portable batch mixer with characteristics suitable for maximum efficiency in the handling of heavy materials has been placed on the market

HARSHAW ANODES AND CHEMICALS

meet the highest standards of the plating industry . . . Anodes and chemicals for every kind of plating.

THE HARSHAW CHEMICAL CO.
Cleveland, Ohio and Principal Cities

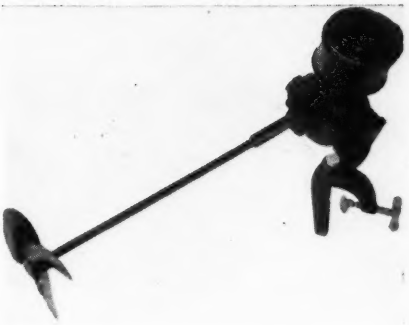
by Eastern Engineering Company, 45 Fox St., New Haven, Conn. This unit is said to be ideal for the slow speed mixing of liquids which contain small particles, such as crystals, that cannot be distorted by the propeller blade. The unit can be used only where compressed air is available.

The air motor with which the slow speed air powered mixer is equipped is rated at 1½ h.p. with a maximum speed of 400 r.p.m. on 40 lbs. pressure. The speed of the unit can be varied by reducing the air pressure. The motor is equipped with an exhaust silencer.

An adjustable clamp is provided for convenient attachment to the edge of the container. A stainless steel shaft is coupled to the motor through a nickel plated tube type coupling. A 12 in. diameter nickel plated bronze propeller is fastened to the end of the propeller shaft.

The agitator assembly can be furnished with dual propellers or with Monel metal or stainless steel construction.

Since the unit is explosion proof, it can be operated without danger in the presence of serious fire hazards. The motor is of variable speed and thus the unit can be used in applications where two or more mixers of various sizes would be required. The motor is completely enclosed, thus making it suitable for use in places where splashing or fumes may be harmful to the motor.



Eastern Slow Speed Air Powered Mixer

Harris "Sealflex" Fittings

A new line of low cost tube fittings having high pressure capacity rating, flexibility for rigid tube of up to 10 deg.

Let the Users of Buffs decide their Merits

Our Customers Say:

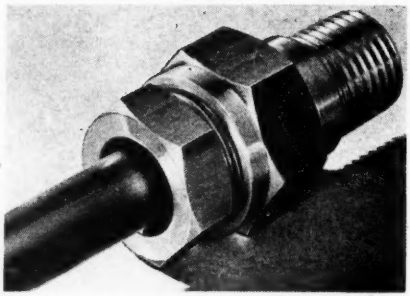
"There are a number of good buffs made and sold."

"Some of these do excellent work in many lines."

"But among them all, we place BIAS Buffs *First*. They have stood the test of the years—for uniform service—for economy—for lasting quality; and we who use this buff know from experience!"

A trial order of BIAS Buffs will be convincing. (BIAS Buffs are used by firms engaged in Defense Work.)

The BIAS BUFF *and* WHEEL CO., Inc.
430 Communipaw Ave.
Jersey City, N. J.

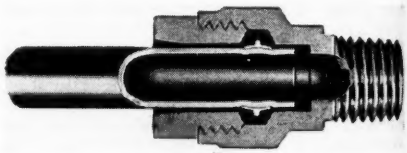


"Sealflex" Flexible High Pressure Tube Fitting

included angle yet which eliminate necessity for special, costly flexible tubing, and reduce sound transmission in lines and permit rapid assembly without special tools for the lower capacity uses has been announced by Harris Products Company, 5426 Commonwealth Avenue, Detroit, Michigan. The new fittings, to be known as "Sealflex" will handle high pressures while permitting vibratory flexing up to 10 degrees included angle.

At present they are made in a wide range of standard sizes and are available for handling virtually any fluid. They can be used for air, gas, or liquids and are supplied with standard pipe threads.

The high pressure capacity and the flexibility of the tube-to-fitting connection is the result of the unique design which uses an insulating, flexing medium of rubber or synthetic. Yet it is so arranged that the tubing is prevented from slipping by a metal ferrule which is "rolled in" on it. Thus, the connection does not depend upon the shear strength of the rubber or synthetic and eliminates the possibility of pressure swedging down the end of the tube to permit failure of the connection.



Cutaway section of Harris "Sealflex" fitting shows how ferrule grips the tube to provide a slip-proof connection yet one which permits wide angle flexing.

Considerable assembly time is saved, since no flaring of the tube is necessary for the lower angle of flexibility, thereby eliminating possibility of splitting the tube at the flare and permitting leakage.

When the fitting is to be used under conditions requiring wide angle flexing or high vibration frequencies or in applications where sound transmission must be reduced, the ferrule must be "rolled in" with the tubing. The rub-

Quality Abrasives

FOR POLISHING AND BURNISHING

ALUMINUM OXIDE • SILICON CARBIDE • CORUNDUM • TURKISH EMERY

Selected ores carefully refined to give you better polishing and burnishing performance.

AA QUALITY ABRASIVES

AMERICAN ABRASIVE COMPANY
WESTFIELD MASS.

RECOVERED TALLOW

An excellent Tallow reclaimed from Harness Leather. This product is unusually high in heat resistance, due to the absorption of the natural chemical properties contained in harness leather.

Write for samples and quotations.

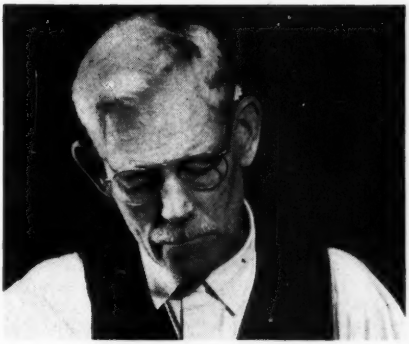
M. ROSS MASSON COMPANY
Dept. P.F.
2160 Montcalm St., Indianapolis, Ind.

ber insulator is placed over it and the rest of the fitting assembled in the usual manner. The pre-assembly of ferrule to tube requires a few turns of a ferrule rolling tool, an adaptation of a tube cutter. This rolls the ferrule down onto the tube so that the tube will not slip. Restriction in the line when the ferrule is "rolled in" to handle highest pressure work causes a restriction of only approximately .0020 inches on the I.D., it is said.

The design of the "Sealflex" fitting permits it to be reconnected with the same tube and ferrule without renewing the rubber or synthetic insulator grommet. Once they have been "rolled in" for a high pressure connection, ferrules can be removed, but not reused.

A.O.C. Super Armorplate Lenses

In view of the present national emergency, and the tremendous importance of maintaining the health of our skilled as well as unskilled workers at the highest peak of efficiency, American Optical Company, Southbridge, Mass., announces it has made available seven different styles of safety goggles fitted with Super Armorplate Lenses which can be ground to prescription. Both eye correction as well as eye protection for industrial workers with defective vision are thereby provided.



A.O.C. Super Armorplate Lenses

These special protective - corrective safety goggles, according to the announcement, include spectacle and side-shield types for different kinds of eye hazards, and the extra-strong, hardened Super Armorplate Lenses can be obtained in either clear white or Calobar and Crookes glare protection glass.

Did you know that . . . .

Instrument dials are automatically coated with a finishing material which resists the deteriorating effects of heat, fumes, and moisture? See page 10.

Industrial first aid instruction is offered through 3,700 chapters of the American Red Cross? See page 16.

Leather scrap is used in an important phase of barrel finishing procedure? See page 36.

A complete set of illustrations showing modern gold plating procedure appear in "Modern Gold Plating—Part 13"? See page 48.

The October issue of PRODUCTS FINISHING will feature the National Metal Congress and Exposition? See page 61.

Literature describing 22 items of metal finishing equipment and materials is available? See page 86.

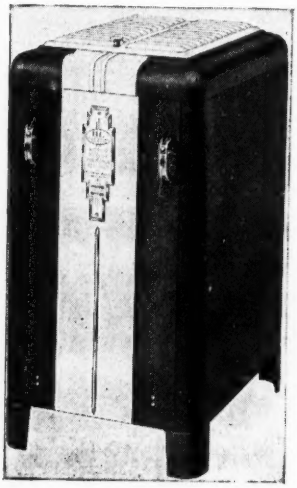
Benwood Linze Electroplating Rectifier

The Benwood Linze Co., 1850 Washington Ave., St. Louis, Mo., announces the addition of a B-L Dry Plate Rectifier for electroplating to its established line of rectifiers and rectifier equipment.

Prior to the present national emergency, dry plate rectifiers were infrequently applied to electroplating processes. However, the unusual demand and increased pressure on all industries occasioned by the emergency brought about the necessity of expanding present electroplating production and establishing entire new plant facilities.

Endeavoring to contribute its share to defense and industry, Benwood Linze engineers have designed special dry plate rectifiers for electroplating. They are extremely flexible and economical in operation. They will serve individual tanks; or a number of units may be grouped in series for maximum high voltage requirements.

The rectifiers are assembled in cabinets, as complete units, less controls.



Benwood Linze Electroplating Rectifier

They are compact and mobile. Models are available for 300 ampere and 500 ampere capacities, at 6 volts and 12 volts—operating from 230 volt and 440 volt, three phase, 60 cycle, a.c. service.

Control units are also available which provide a variation in voltage from the maximum for the unit down to zero volts.

Burgess Model 501 Conference Acousti-Booth

The Burgess Model 501 Conference Acousti-Booth for use in noisy plants where a quiet conference place is required has been brought out by the

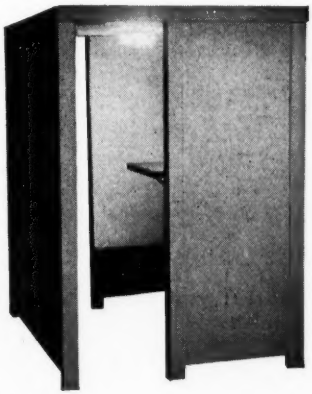
Assures Better and Faster
FINISH BAKING
FOR DEFENSE
The proper finish baking oven will improve results, eliminate rejects, speed up production and cut costs. See Despatch for proper recommendations and the proper oven for better and faster finish baking.

A DESPATCH OVEN BAKING FINISH ON MOTORS
WRITE FOR DETAILS
DESPATCH OVEN COMPANY
MINNEAPOLIS, MINNESOTA

ROBERTS Says: DON'T BE CONFUSED by big promises. After all's said and done, quality is remembered long after price is forgotten, and promises mean nothing unless backed up by performance. We are proud of our reputation for quality and service and we are confident of our ability to serve you faithfully and well.
THE ROBERTS ROUGE CO., Specialists in manufacturing thoroughly dependable Gold, Sterling and Silver Plate Rouges; Stainless Steel, Chrome and Crocus Compounds. STRATFORD, CONN.

Burgess Battery Co., Acoustic Division, 536 W. Huron St., Chicago, Ill. Similar in construction to the Burgess Telephone Acousti-Booth, the conference booth has walls of sound absorbent construction to absorb factory noise.

The Model 501 booth is designed to meet the need for a large "zone of quiet" for conferences in noisy factories, for use where several telephones may be installed in one location, and for testing operations such as listening for noise in electric motors. It can also be used as a temporary miniature office in new or remodeled factories where construction is not complete.



Burgess Model 501 Conference Acousti-Booth

Sound-absorbing walls in the conference booth deaden extraneous noise and enable persons within to carry on work without noise interference. A doorless entrance at each end permits ready access to the booth and provides ample natural ventilation. Acoustic construction of the booth makes doors unnecessary. A folding table, 23½ x 24 in., and an overhead electric light fixture add to the convenience of the booth.

The Burgess Model 501 Conference Acousti-Booth is easily portable and can be assembled ready for use in a few minutes time. Constructed of heavy gauge steel, the booth is finished in black wrinkle on the exterior and has a gray interior. On the outside, the booth is 56½ in. long, 54½ in. wide, and 79½ in. high. Shipping weight, 1,000 pounds.

Hanson-Van Winkle-Munning Tumbling Equipment for Processing Machine Gun Parts

A new Mercil type of equipment for tumbling or cutting down machine gun parts is offered by Hanson-Van Winkle-Munning Company, Matawan, N. J. Before these machines were developed, the burrs on the machine gun parts were removed by filing by hand. This barrel is said to give a much better finished product than does hand filing.

The units are built along the same

HECCO BRAND
EMERY

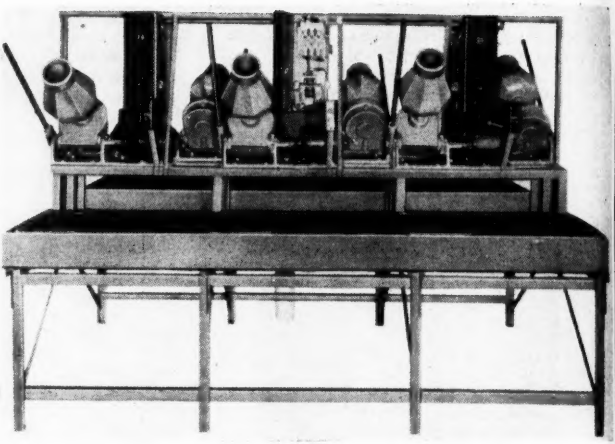
Made from the highest quality selected ores obtainable in this country and in the same careful and thorough manner as imported emeries.

These rough-surfaced solid-shaped grains hold unusually well in the glue.

Write for full details.

HAMILTON
Emery & Corundum Co.
CHESTER MASS.

BETTER PLATING, LESS COST!
"MGC" ELECTROPLATING EQUIPMENT
Write for Interesting Details TODAY!
MOTOR GENERATOR CORP., HOBART SQ. BOX PF 91 TROY, OHIO



Hanson-Van Winkle-Munning Tumbling Equipment for Processing Machine Gun Parts

lines as the Mercil oblique barrels using ½ h.p., totally enclosed ball bearing motors, directly connected to a worm and worm gear reducing unit. The slow speed shaft on the worm gear revolves the cast iron bottlenecked barrels. Timken bearings are used throughout.

The cast iron barrels are octagon shaped, 13¾ in. deep with 5¼ in. opening at the top and approximately 9½ in. across the flats. The cylinders are raised and lowered by means of a lever.

Directly under the cylinders is a sump tank or drain tank and also a perforated tray or basket. The operator unloads the contents of the cylinders into this tray and then flushes it out with a hose, the water and residue going into the sump tank directly underneath. These tanks have a 2-in. drain in the center which is connected to the sewer.

The small machine parts which are processed are run with silica sand and oil from two to four hours, depending on the size of the load and the size of the pieces from which the burrs are to be removed.

These units can be built in single or multiple type.

Eclipse Electric Eye Operated Sprayer

The Eclipse Air Brush Company, 400 Park Ave., Newark, N. J., is building automatic spray machines with electric

KEEP 'EM FLYING!

RUST GREASE DIRT

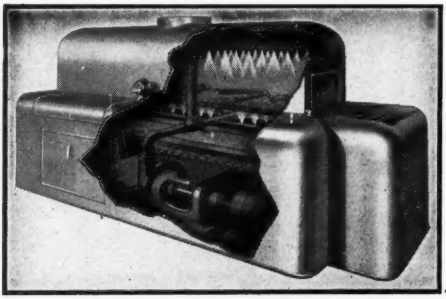
Use

SOL-KLEAN

INDUSTRIAL CHEMICAL PRODUCTS CO.

Detroit

Chicago **Ft. Wayne**



HYDRO-FLOW

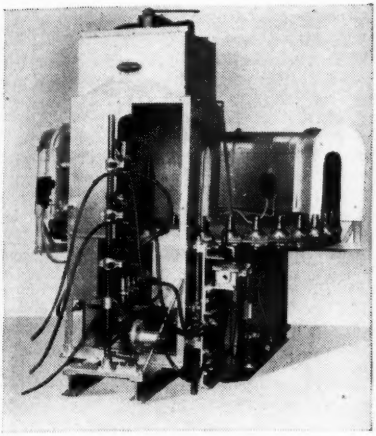
Industrial Washing Machines

Streamlined design. Hidden motors, pumps and pipes are easily assembled. Piping and nozzles located to insure thorough cleansing of all surfaces. Rugged and efficient pressure pump. Corrosion resistant spray nozzles—from mist to open stream. Monorail, Belt or Gravity type conveyors designed to carry any shape or size material. Variable speeds on conveyor drive synchronize production.

International Conveyor & Washer Corp.

Write for circular.

640 E. FORT ST. DETROIT, MICH.



Eclipse Electric Eye Operated Sprayer

eye control to coat the inside and outside of projectiles in one operation.

The shells are placed on the indexed turntable manually, carried around to a position in front of automatic spray guns that coat the outside, while an extension nozzle on another gun comes up to spray the inside. The action of the guns is controlled by an electric eye device so that there is no spray unless a shell is in the holder.

After being sprayed, the shells enter a steam jacketed oven that is built over the back of the table. When they emerge from the oven, the projectiles are removed by the operator. This machine will handle 75 mm. armor piercing shells at a rate of 500 an hour.

Triton 720

A synthetic detergent called Triton 720 and described as "an aqueous paste of a sulfonated ether salt" has been placed on the market by Rohm & Haas Company, 222 W. Washington Sq., Philadelphia, Pa. It is said to be widely useful in the enameling and electroplating fields where stability makes it suitable for either acid pickling baths or alkaline cleaning solutions.

Triton 720 is said to disperse scum that forms on the top of acid pickling tanks, thus increasing the life of the acid and eliminating faulty cleaning. When Triton 720 is added to the acid bath, a light foam forms on top of the tank and prevents disagreeable acid fumes from escaping.

In alkaline cleaning solutions, concentrations of Triton 720 ranging from 1/10 per cent to two per cent of the weight of the bath are recommended, and are said to remove greasy film from metal and prevent precipitation of metal salts on the surface of the parts.

"Hygrade" Continuous Row Miralume Fluorescent Lighting Units

Hygrade Sylvania Corporation, Ipswich, Miss., announces a line of Con-

TANK SLUDGES ARE VALUABLE

We will purchase Tin—Cadmium—Tungsten —Molybdenum sludges and residues.

Any quantity.

Send samples—Will quote promptly.

Also buyers of all grades of plating room scrap.

Metallurgical Products Co.

Established 1909

Converters—Reclaimers—Processors

35th and Moore Sts. Philadelphia, Pa.

DECREASE DEGREASING COSTS!

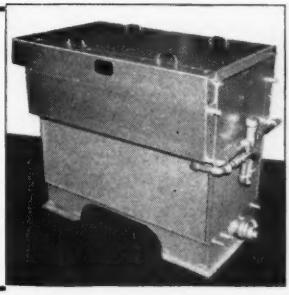
We can build a "D'OILER" (manual or automatic) to handle your degreasing jobs swiftly and economically. May we send you complete details?

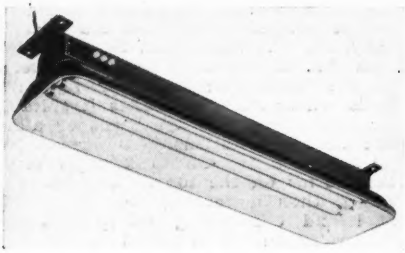
You should use D'OILENE in your degreaser.

MECHANICAL PROCESS COMPANY

SOUTH ORANGE NEW JERSEY

Specialists in the use and handling of chlorinated solvents





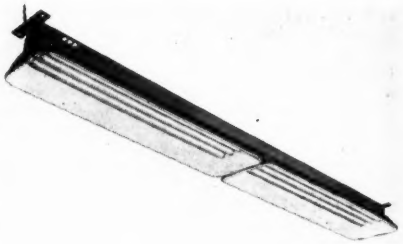
Hygrade Continuous Row Miralume F-154 Fluorescent Lighting Unit

tinuous Row Miralume fluorescent lighting units designed to provide ultra-efficient lighting for industrial operations. The units, designated as F-104, F-208, F-154, and F-308, may be joined end to end with like units or with one another to form a continuous wireway enclosure. Miralume F-104, F-208, F-154 and F-308 are supplied with end caps for individual mounting. Miralumes F-104J, F-208J, F-154J and F-308J are supplied with a connecting band for continuous row assembly. Thus, instead of providing a single electrical outlet for each unit, one outlet can be made to supply a row of units.

The units are easily maintained. The reflectors are attached to the top housing by fittings which cannot break up or chip the high-quality porcelain reflecting surface, and starters are located in the top housing where they are easily accessible without removing the lamps.

Miralume F-104 is a 100-watt unit, complete with two 40-watt T-12 Hygrade fluorescent lamps. Overall length is 53 3/8 in.; overall width, 13¾ in., and overall height, 7¼ in. Average weight is 32 lb. The unit is equipped with white porcelain enamel reflector and French gray outside finish. Miralume F-208 consists of two F-104 reflectors joined end to end on a single channel housing. Overall length is 106 7/8 in., and average weight is 64 pounds.

Miralume F-154 is a 150-watt unit,



Hygrade Continuous Row Miralume F-308 Fluorescent Lighting Unit

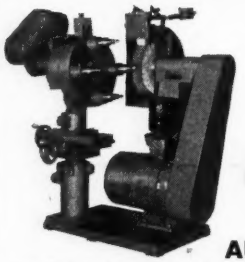
complete with three 40-watt T-12 Hygrade fluorescent lamps. Overall length is 53 3/8 in.; overall width, 13¾ in.; overall height, 7¼ in., and average weight, 37 lb. The unit is equipped with white porcelain enamel reflector and has French gray outside finish. Miralume F-308 consists of two F-154 reflectors joined end to end on a single channel housing. Overall length is 106 7/8 in. Average weight is 73 pounds.

All four units described above are equipped with Hygrade Dua-Lamp high power factor auxiliaries and Hygrade Mirastat starters. The units are available for 110-125 volts, 60 cycle a.c., also for 50 cycle a.c. on request.

Alrose Bon White

The Alrose Chemical Company, Providence, R. I., announces Bon White, a

Get Hep to This for Polishing and Buffing! Faster and Cheaper



ACME SEMI-AUTOMATIC and Lathe Combination Unit

One of the many Acme Automatics designed to speed up production and reduce production costs. Send sample for free production estimate.

ACME Manufacturing Co.
1642 HOWARD ST. • DETROIT, MICH.
Builders OF AUTOMATIC POLISHING AND BUFFING MACHINES FOR OVER 25 YEARS

new immersion tin finish, applicable to all copper and brass surfaces. Bon White may be applied in 10 seconds and can, in many instances, replace slow boiling methods of tin plating. Bon White solution is prepared by dissolving 16 ounces of sodium cyanide and six ounces of Bon White paste in one gallon of boiling water. When cooled to room temperature, no further heat is necessary and no adjustment is required, as the material is completely plated from the solution.

The life of the Bon White solution depends on the production volume. Enamel and glass containers are used and the work can be handled in baskets or on wire. Bon White is said to assure an inexpensive, highly effective, white finish and, being pure tin, offers considerable tarnish resistance.

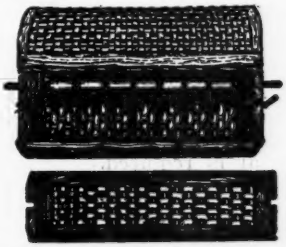
Series BH Industrial Timers

Signaling timers driven by synchronous motors and designated as the Series BH for use in plating control, ovens, mixers, and so on, have been placed on the market by Industrial Timer Corp., 117 Edison Place, Newark, N. J. BH Timers are specially designed to provide a warning signal upon completion of operations involving a controlled time period of exposure to light, heat, electric current, mechanical agitation, or other process work.

Series BH Industrial Timer

BH Series Timers are equipped with two receptacles, black for controlled external circuit, red for remote control

YOU'LL GET
BETTER CLEANING
BETTER PLATING
with
ORVUS
(A SULFATED FATTY ALCOHOL)
in your alkaline cleaning bath!
ASK FOR FURTHER DETAILS
PROCTER & GAMBLE · CINCINNATI, O.

INVESTIGATE
FOR SOMETHING
BETTER
SIZES FOR ANY EQUIPMENT
KING

PLATING BARRELS
Write for illustrated folder.
Use them once—you'll use them always
JOHN KING
48 SPRINGFIELD ST., DAYTON, OHIO

push buttons, foot switches, machine operated contact closures, and so on. BH Series Timers will sound a buzzer at the end of a timed interval and keep it buzzing until push button is operated for another timed interval, or until manually shut off by means of a toggle switch. All controls, including buzzer, are component parts of the timer unit and mounted on or within the timer case.

Series BHR Timers provide, in addition to the audible signal, a set of contacts to operate additional buzzers, gongs, lights, and so on. The timers with longer time cycles are equipped with a rugged mechanical latch-in relay, electrically operated and electrically released, so that no current is consumed during timed interval by the relay itself.

NOW...

S-310

RUST INHIBITIVE

Formulated specifically for the following properties:

1. Very fast air-drying
2. Water-whiteness
3. Tenacious adhesion
4. Hardness combined with flexibility

and

RUST RESISTANCE

S-310

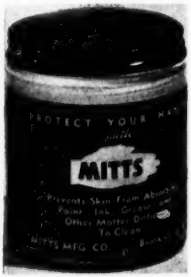
is used and recommended as a clear coating for hand tools, machine tools, hardware and wherever a clear protective coat for bright metal is required.

The Varnish Products Co.
5208 Harvard Ave. Cleveland, Ohio

"Mitts"

A protective hand cream to be known as "Mitts" has been placed on the market by Mitts Manufacturing Co., 367 E. 45th St., Brooklyn, New York.

Mitts is said to be a water soluble hand cream that can be applied to the skin before starting work. It dries quickly and acts as an invisible glove guarding the hands from grease, paint, ink, and other material difficult to clean.



"Mitts" Protective Hand Cream

Mitts is also said to protect the hand from many irritating materials which cause industrial skin trouble. It is said to wash off easily with soap and water.

Electro-Jetalizing

A black, rust-proof finish for copper can be applied by means of the "Electro-Jetal" process which has been placed on the market by Alrose Chemical Co., Providence, R. I. According to the manufacturer, any metal that can be copper plated can be blackened by Electro-Jetalizing.

After preplating with copper, products being treated are immersed in a special electrolytic oxidizing bath for two to five minutes. The resulting velvety black surface is an excellent absorptive base of an after treatment of oil, wax, or lacquer.

The bath can be operated at any tem-

For a real good polishing job use

KEYSTONE EMERY

TURKISH — NAXOS — AMERICAN

KEYSTONE EMERY MILLS *Write for Sample* 4316 Paul St., Phila., Pa.

perature below the boiling point of water, using ordinary steel containers heated by steam coils. Work can be oxidized on racks, in bulk or in baskets. The chemical cost, exclusive of the copper plate, is said to be about 25c per 1,000 sq. ft. of surface. The process has been applied industrially, and it is claimed that one firm is using the process on more than 260,000 small parts per day.

Quincy Air Compressor Selector

An air compressor selector especially designed to aid in selecting the correct size and type of compressor for a specific job in one simple setting has been announced by the Quincy Compressor Co., Quincy, Illinois.

The compressor selector functions like a slide rule. One setting of the scale shows the correct compressor model number, free air delivery, r.p.m., piston displacement, and motor horsepower required. The selector also contains figures for making allowances for loss in free air delivery at high altitudes. Tests have proved that the selector is extremely accurate for both air and water-cooled compressor applications requiring up to 80 cu. ft. displacement. Pressures covered by the selector range from 30 to 250 pounds.

Quincy Air Compressor Selector

This is the first time, according to the company, that a selector of this type has ever been worked out. Its application in the solution of compressor problems is said to effectively simplify the work of purchasing agents, engineers, architects, and salesmen in selecting the right size and type of air compressor for specific applications, and to save valuable time by supplanting performance curves, tables, and so on.

Copy of the selector free upon request.

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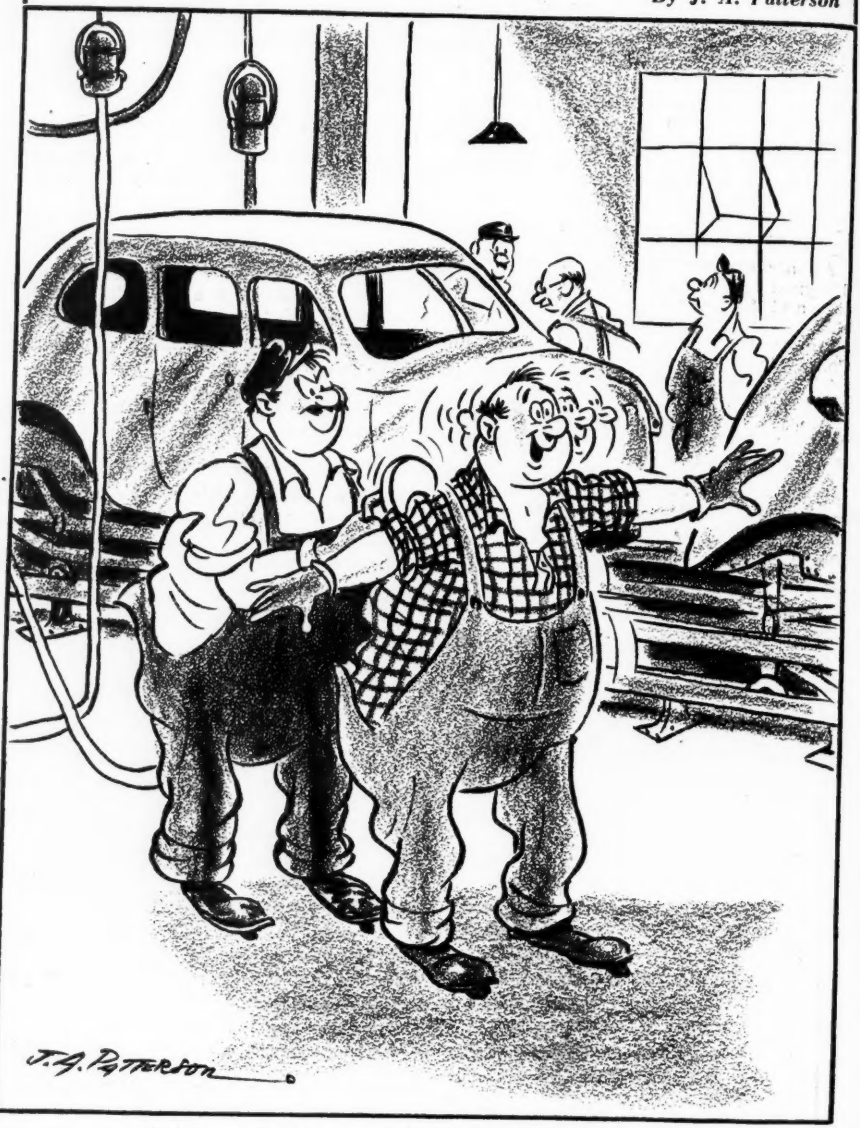
The Finishing Touch

By J. A. Patterson



"Oh boy! That's where it itches most—now go to it!"

Industrial Plastics. The second edition of "Industrial Plastics," by Herbert R. Simonds, is now being published by Pitman Publishing Corporation, 2 W. 45th St., New York City. This is a timely edition of the standard book on the many valuable types of plastics available and their vital uses in industry.

Wartime developments in plastics, newly treated by the author, include their use for planes and their parts, bomb fins, bullet-proof composite plates, submarine battery holders, machine gun carriers, cartridge shells, infantry gun stocks, and so on. Mr. Simonds discusses all types of plastics, including fibers and bristles, developed since the first edition was published, and provides new data on Japanese and other foreign research. Material on the chemistry of plastics has been completely revised in the light of late research and all tables, statistics and charts have been brought up to date.

Comprehensive, but concise and simple, Mr. Simonds' authoritative study is concerned more than any other available volume with the use of plastics as engineering materials. Here is a book fully geared to today's industrial progress—an indispensable source of information for the user and prospective user of industrial and structural materials. The many suggestions for new applications and markets are helpful to those associated with the production and fashioning of plastics as well as to manufacturers. For technical schools and colleges, Industrial Plastics is an interesting and promising new field.

A copy of Industrial Plastics, second edition, may be obtained by writing to Pitman Publishing Corporation. The price is $4.50 a copy.

Lyon Steel Shop Equipment. Of special interest to manufacturers and jobbers is a 40-page comprehensively illustrated catalog on steel shop equipment products, recently released by Lyon Metal Products, Incorporated, 3093 Clark St., Aurora, Ill. The catalog illustrates such steel shop equipment as work benches, stools, stock and tool carts, tool cribs, cabinets and numerous special purpose products.

A large number of new items including arc and gas welding benches, sheet metal worker's bench, two and three shift drawer inserts and other products are shown.

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Opportunity Section

This Opportunity Section is available for classified advertisements featuring equipment, employment, business opportunities, etc., in the industries devoted to the cleaning, plating, polishing and finishing of metals. For advertising rates and other information address:

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Spray Booths—One with 6' 6" x 6' 0" opening, one 6' 6" x 8' 0" and one 7' 8" x 10' 0", good condition and complete with exhaust fans and three phase AC motors. Average Price, $150.00 each.

HUBENY BROTHERS, INC., Roselle, N. J.

FOR SALE

Ointment Mill

No. 000 Harris Force Feed Ointment Mill with bronze grinders, automatic Ratcher Feed, J & L pulleys, Gears covered, New Equipment.

Address Box 75

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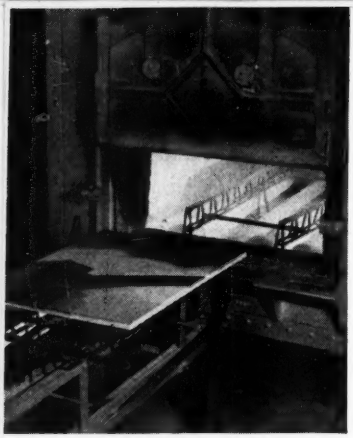

FOR YOUR Catalog LIBRARY

To obtain copies of the catalogs listed here, indicate on the coupon the number of the item in which you are interested and mail as directed.

1. Multi-Purpose Plating Barrel
A Multi-Purpose plating barrel for small parts is described in literature which is now being published by The Udylite Corporation, 1651 E. Grand Blvd., Detroit, Michigan.

2. Oakite Compound No. 32
A scientifically developed material for the safe removal of hard water scales, rust and similar deposits from equipment, parts and other metallic surfaces, known as Oakite Compound No. 32 is described in a 20-page catalog now being issued by Oakite Products, Inc., 20 Thames St., New York City.

3. Speeding Metal Products Finishing
"Speeding Metal Products Finishing with Parlon Fortified Synthetic Enamels" is the title of a 12-page folder which is now being issued by Hercules Powder Company, 904 Market St., Wilmington, Delaware.

4. Platers' and Polishers' Handbook
A platers' and polishers' handbook designated as "Puritan Handbook" is now being issued by Puritan Manufacturing Company, Waterbury, Connecticut.

5. Sea-Lac Facts
The Duralac Chemical Corporation, 82 Lister Ave., Newark, N. J., is now publishing "Sea-Lac Facts" describing new Sea-Lac finishes.

6. Newcomb-David Catalog
A 60-page catalog covering spray booths, industrial ovens, metal parts washers, exhaust systems, ventilating systems, and other sheet metal equipment manufactured by Newcomb-David Company, 5741 Russell St., Detroit, Mich., is now being issued by the company.

7. Du Pont High Speed Brass
The Electroplating Division of E. I. du Pont de Nemours & Company, Wilmington, Del., is now issuing a catalog describing an electroplating process for the rapid production of smooth, bright brass deposits.

8. Suporcel Porcelain Metals
A beautifully illustrated six-page folder explaining the use and application of Suporcel Porcelain Metals is now being issued by Porcelain Metals, Inc., 28 Borden Ave., Long Island, City, N. Y.

9. Pickling Tank Control
Savings of production time, steam, and acid in pickling operations by means of Foxboro Recording Controller is the subject of a four-page folder now being issued by The Foxboro Company, Foxboro, Massachusetts.

10. Metal Conditioner and Cleaner
A corrosion solvent process designated as Corrosol No. 6 for use in protecting metal and prolonging life of paints is described in a folder now being issued by International Rustproof Corporation, 12507 Plover Ave., Cleveland, Ohio.

11. Hammond Variable Speed Lathe

A four-page folder illustrating and describing a method by which speed changes of 1,500 to 3,000 r.p.m. can be obtained instantly on the Hammond VRO Polishing and Buffing Lathe is now being issued by Hammond Machinery Builders, Inc., 1622 Douglas Ave., Kalamazoo, Michigan.

12. Clean Air

A folder telling how clean air is provided in America's blacked out factories is now being issued by American Air Filter Co., Inc., 254 Central Ave., Louisville, Kentucky.

13. Textured Enamel Finish

An improved textured enamel finish known as Rincontrol is fully illustrated and described in a folder now being issued by Roxalin Flexible Lacquer Co., Inc., Box 713, Elizabeth, New Jersey.

14. Metal Cleaning Tips

The chemical classification and selection of alkaline metal cleaners is contained in a bulletin which has been prepared and is now being distributed by the Cowles Detergent Company, 7016 Euclid Ave., Cleveland, Ohio.

15. Finishing Equipment Catalog

A very complete catalog illustrating and describing finishing equipment of all kinds is now being issued by Industrial Sheet Metal Works, 630 E. Forest Ave., Detroit, Michigan.

16. Heavy Duty Grinders and Buffers

The complete line of Marshke Heavy Duty Grinders and Buffers manufactured by Vonnegut Moulder Corporation, 1845 Madison Ave., Indianapolis, Ind., is illustrated and described in a 22-page catalog now being issued by the company.

17. Industrial Ovens

A 20-page catalog covering oven construction, method of heating, source of heat, and material handling is now being issued by J. O. Ross Engineering Corporation, 350 Madison Ave., New York City.

18. Airway Ventilated Buffs

Cool cutting buffs for high speed buffing operations are illustrated and described in a 4-page folder now being distributed by Jackson Buff Corporation, 20-03 41st Ave., Long Island City, New York.

19. Orvus for Alkaline Cleaning Baths

All those engaged in metal cleaning operations will be interested in information regarding an alkaline cleaning bath addition agent known as Orvus now being distributed by Procter & Gamble Co., Gwynne Bldg., Cincinnati, Ohio.

20. General Electric Immersion Heaters

Bulletin GEA-3195 now being issued by General Electric Company, Schenectady, N. Y., tells how to heat electroplating baths with General Electric Immersion Heaters.

21. New Wrinkles in Finishing

Vol. 3, No. 3 of this publication contains 12 pages of pertinent information on the application of Wrinkle Finishes marketed by New Wrinkle, Inc., Mutual Home Bldg., Dayton, Ohio.

22. Glass-Electrode pH Indicator

An eight-page illustrated catalog describing a new glass-electrode pH indicator is now being issued by Leeds & Northrup Company, 4934 Stenton Ave., Philadelphia, Pennsylvania.

Print plainly in filling out coupon for literature.

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431 Main St., Cincinnati, Ohio

I am interested in receiving the following literature reviewed in your September issue.

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(Insert numbers denoting literature you want.)

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Company .....

Company Address .....

City ..... **State**.....

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PLATING

POLISHING

FINISHING

SEPTEMBER • • 1941

Beauty Takes a Beating!

Yes, it's possible for a finish to withstand a tough beating and still retain original eye-appeal for years. That's why hot water heaters are finished with Roxyn 11C, which meets the conditions of [illegible].

Roxyn 11C is equally good in the basement where positive protection against moisture and dirt is required or in the kitchen where the finish must match perfectly with ranges and refrigerators and be completely unaffected by grease and repeated washing. At the same time Roxyn 11C will not turn yellow when exposed to elevated temperatures in service and is so mar-resistant that accidental abuse will not detract from its good appearance.

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ROXALIN *Flexible* FINISHES

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FROM

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TO

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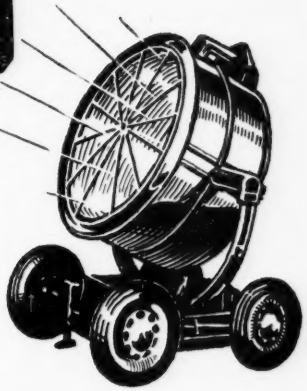

Dependable Oakite cleaning is YOUR ANSWER for FASTER production and LOWER unit costs

Today . . . with so much to be done . . . industry cannot afford any production delays on Defense Orders. And when it comes to the important cleaning operations, leading manufacturers of a wide variety of products . . . ranging from binoculars to searchlights . . . make sure they get the thorough, fast, low-cost results required by using DEPENDABLE Oakite cleaning.

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Packed with informative data on NEW, improved production cleaning materials and methods, this 32-page booklet is ready for mailing . . . yours FREE for the asking! Won't you write for YOUR copy now?

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FOR YOUR PLATING AND ANODIZING REQUIREMENTS

Udylite's service to the metal finishing industry is complete, dependable and convenient.

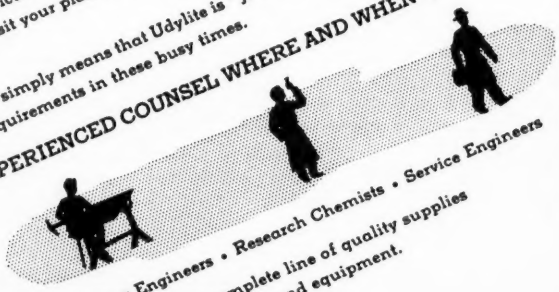
Udylite has a complete line of electroplating, polishing and anodizing supplies and equipment second to none in quality and dependability. Each product has been time-tested under every condition—in actual operation.

Udylite's designing engineers and electrochemists know metal finishing. They will gladly help you lay out a new plant or redesign your present one for greater efficiency. Their years of practical experience are at your service. You can turn the job over to Udylite with the assurance that it will be handled *right*—complete in every detail.

Udylite service engineers supervise the installation of equipment and periodically visit your plant to make certain that maximum efficiency is maintained.

All this simply means that Udylite is "just the ticket" for your metal finishing requirements in these busy times.

EXPERIENCED COUNSEL WHERE AND WHEN YOU NEED IT



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Save
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MONEY
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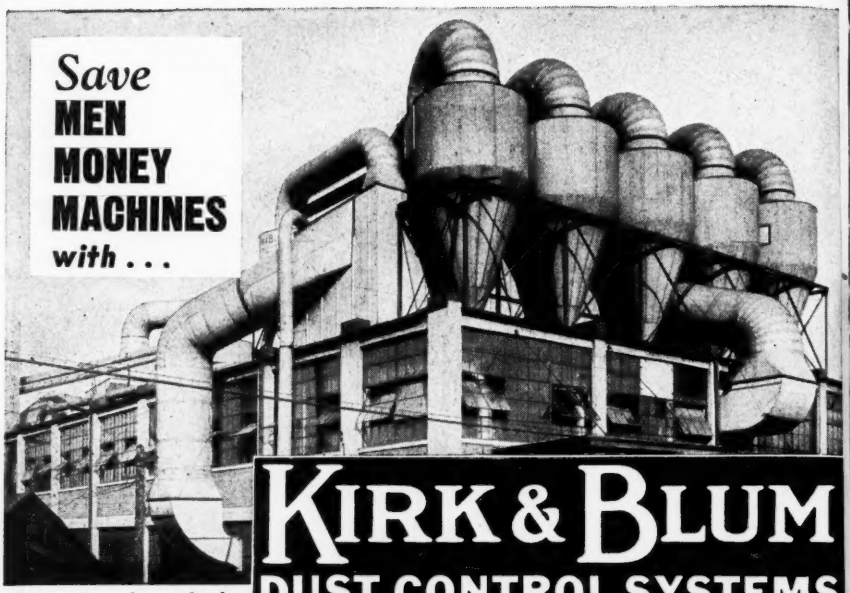

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Air from the cyclone outlets is passed through Airmat Filters and returned to building, saving much heat.

AT THE Detroit factory illustrated above, approximately 100,000 cubic feet of air is exhausted from the workrooms each minute. The problem that KIRK & BLUM Engineers were called upon to solve was the removal of dust from this large volume of air so the air could be returned into the building, thus reclaiming the heat and eliminating the neighborhood dust nuisance and the partial vacuum created within the building.

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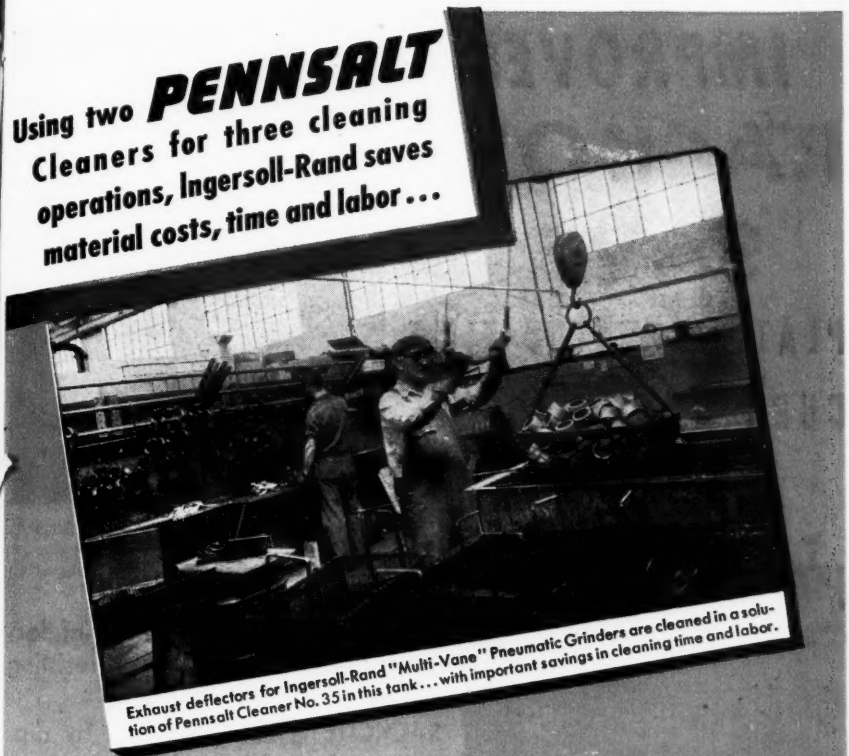
Using two PENNSALT Cleaners for three cleaning operations, Ingersoll-Rand saves material costs, time and labor...



Exhaust deflectors for Ingersoll-Rand "Multi-Vane" Pneumatic Grinders are cleaned in a solution of Pennsalt Cleaner No. 35 in this tank... with important savings in cleaning time and labor.

Ingersoll-Rand Company, famous manufacturer of pneumatic tools, compressors and other equipment, has achieved important savings in three cleaning operations by using two Pennsalt Cleaners.

1. For still tank cleaning of many metal parts prior to Parkerizing, Ingersoll-Rand uses Pennsalt Cleaner No. 35, saving time and labor.

2. Similar savings have resulted from Ingersoll-Rand's use of Pennsalt Cleaner No. 35 for still tank cleaning of metal parts after hardening.

3. In spray washers which clean iron and steel castings, forgings and bars, bronze, brass, zinc and aluminum parts... about 10,000 different metal parts... Ingersoll-Rand uses Pennsalt Cleaner No. 32 with great success. This cleaner efficiently removes machine oil and polishing compounds from the metal parts, and also provides rust protection between processing steps. By changing to Pennsalt Cleaner No. 32, Ingersoll-Rand saves an estimated 37% in the cost of cleaning materials ...*and* gets better results!

If you have a metal cleaning problem there is a Pennsalt Cleaner which will meet your specific needs... and probably save *you* valuable time, labor and cost. Write today to our Pennsalt Cleaner Division for information.

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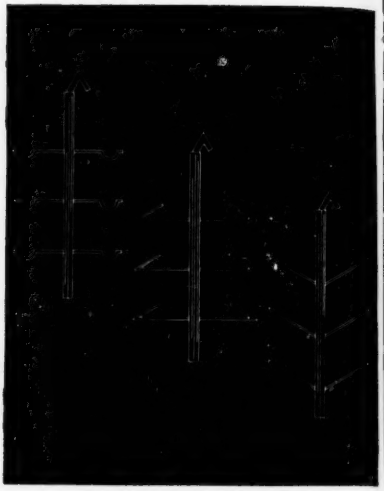
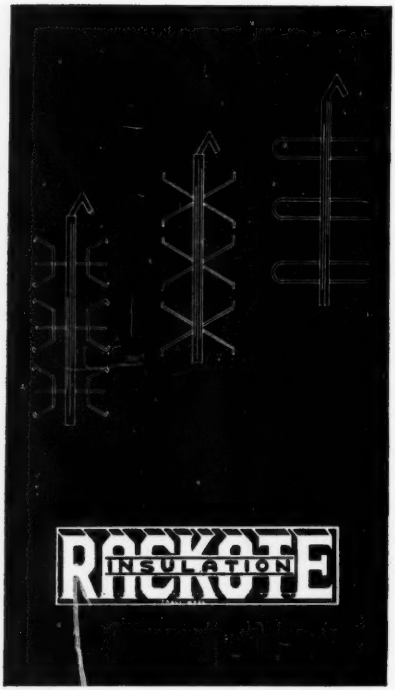
IMPROVED
RACKOTE
SAVES
PLATING SET-UP TIME
CURRENT AND ANODES





RACKOTE is a combination of lacquer and acid- and alkali-resisting plastics.

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This is what we mean by

A COMPLETE FINISHING SYSTEM *engineered*

to the customer's specific demands

Producing modern finishing equipment is only part of the job undertaken by Mahon engineers. They plan and place this equipment to meet plant and product conditions.

For example: In the Complete Finishing System just completed for the Heywood-Wakefield Company, Gardner, Mass. (pictured herewith) it originally was contemplated to use either oil or gas for oven heat. But our survey disclosed it to be more satisfactory to use high pressure steam heat, which eliminated fuel tanks, reduced initial installation costs and lessened year-round operating expense. Likewise, the dry-off oven was so located that space previously considered useless was put on a paying basis.

If your *finishing* operations require modernization, Mahon experience and knowledge undoubtedly can save you money, too.

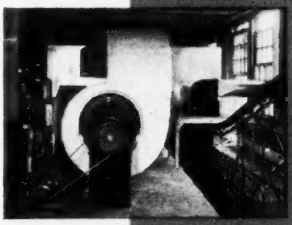
THE R. C. MAHON COMPANY
DETROIT • CHICAGO

Designers and Manufacturers of Complete Finishing Systems, Metal Cleaning Machines, Rust Proofing Machines, Hydro-Filter Spray Booths, Ovens of All Types, Filtered Air Supply Units, Hydro-Foam Dust Collectors, and many other Units of Special Production Equipment

Conveyor entering 2-stage Washing and Drying Unit. Washing Machine exhaust fan and Oven heating system is located under ceiling.

Washed and Dried Parts emerging from Dry-Off Oven. Note that this Oven is located between two buildings in previously wasted space.

Painting department. At extreme right, Flo-coat unit for color-work. Center, Hydro-Filter Spray Booths. Left, Parts descend to bottom of Baking Oven.



Parts entering the Baking Oven. This Oven is unusual in that source of heat is super-heated steam, with a top temperature of 350°, automatically controlled by air-operated valve.

Showing arrangement of Oven and heating system. Overall length of Oven 80 feet. Controller is separately mounted. Normal operating temperature of 250° is attained within 15 minutes of starting heating system.

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METAL PART
Washers
ENGINEERED
TO YOUR NEED

No matter what your cleaning problem may be . . . inter-process or final cleaning . . . the removal of drawing compounds, oil, salts, caked-on soil, etc. . . . or whether alkali solutions, caustic strippers, petroleum spirits or the new emulsion cleaners are used . . . a Detrex washer can be engineered and built to meet your needs.

Our long experience in the manufacture both of washers and a complete line of cleaning materials . . . toget with our modern research laborato and large engineering staff . . . alw assure you of efficient, safe and w built equipment. Write for compl details.

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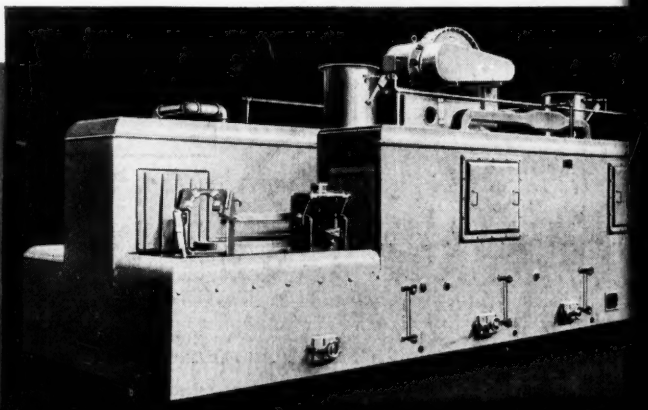
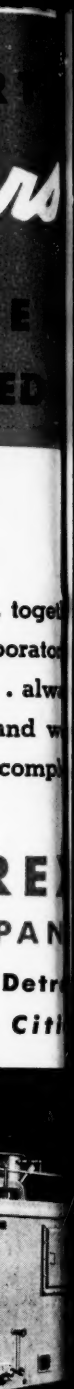
SOLVENT DEGREASING and ALKALI CLEANING



Right: Multi-stage spray washer with special tilting fixtures on conveyor. Used in the cleaning of Aircraft engine cylinders.